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THE ÆTIOLOGICAL FACTOR AS A GUIDE TO TREATMENT IN ARTHRITIS, FIBROSITIS, AND ALLIED CONDITIONS.[1]

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I HOPE that the title of my contribution tonight has not given rise to any idea that I have come here to announce a solution of the many vexed problems in relation to the too often inscrutable disorders, arthritis, fibrositis and allied conditions.

When invited to take part in the discussion and to select an aspect on which to treat, I chose the ætiological standpoint because I think we are all agreed that, however useful may be our means of alleviating local pain, with these we are at best treating symptoms. Until we are cognisant of the true cause of the malady, we can make no genuine progress. Even though there is nothing new to say, it may yet be of some value to review what we do know of a complex subject.

As the time at my disposal is limited and I as well as all of you am looking forward with keen interest to Dr. Hoets's views about the treatment by diathermy, about which so much has recently been written, I have thought it desirable to limit my remarks to the conditions he is going to discuss. It will be convenient to take them in the order of sciatica, fibrositis and arthritis.

Sciatica.

Sciatica is extremely difficult to define and it often amuses me when telling a patient that he has sciatica to feel that he knows at once what he has got but that I don't. It is often regarded as a neuralgia, but I think this is erroneous and that though neuralgia may follow it, as it often does in *herpes zoster*, in the vast majority of cases of sciatica there is some measure of true neuritis present. If, however, this measure oversteps an ill defined limit, the trouble ceases to be sciatica and becomes sciatic neuritis. Truly a fine point which adds to the complexity!

Moreover if the sciatica turns out to be due to something outside the nerve, it once more loses its identity and is relegated to the position of pain in connexion with the other condition. Hence before a diagnosis of sciatica is made, all causes of pain such as tumours of the pelvis or its contents

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on August 27, 1925.

or in the upper end of the femur, stone in the ureter, osteophytic outgrowths in relation to the sacro-iliac or hip joints or other gross interference with the nerve must be diligently sought.

It is well to remember that double primary sciatica is rare, so that when both nerves are involved, we should look for some interference with the spinal cord and not omit to test the urine for sugar.

When the above causes have been excluded, sciatica may be diagnosed and it is generally agreed that in the vast majority of cases the pain in some way results from an inflammation of the fibrous tissue about the sheath of the nerve, extending usually to some extent into the enclosed nerve as well. Very often the inflammation has extended there from some fibrositis in the neighbourhood of the joints which are adjacent to the nerve or its component parts. The assistance of the radiologist is invaluable in many cases by demonstrating some significant change in the joints.

Fibrositis.

Our next quest must be for the cause of the fibrositis, and as a preliminary it is essential to define fibrositis, as it is a comparatively recent term and in recent days we are having many new terms inserted in our vocabulary, the meaning of some of which, if known at all, is locked in the brain of the inventor. The term, I think, came into being when pathological investigation of cases, characterized by chronic forms of pain about muscular tissues leading to varying degrees of disability and stiffness, revealed that the only demonstrable changes were in the fibrous tissues—muscular sheaths, tendons, ligaments and fasciæ. In the early stages serous exudations have been found and later, proliferation of the fibrous tissue. Since then the term fibrositis has often replaced the older "muscular rheumatism" and "myalgia."

When the changes occur in the fibrous attachments of muscles about the joints and in ligaments, they are often followed later by bony changes in the joints themselves.

This is the conception of fibrositis I wish to bring before you, but it is only right to remind you that in the excellent article by Dr. George Strathey, of Toronto, in our journal of July 18 last he takes quite a different view. An idea of his view may be conveyed by what he says about pain in the back. He writes:

> I am convinced that the pain of lumbago is not felt in the muscles or fibrous muscle sheaths and that fibrositis, except as it may occur as the early symptoms of the condition which later developes into osteoarthritis, is not a cause of pain in the back.

This makes it difficult to know what we are to say in the matter while waiting for the osteoarthritis to develope.

Of special interest in relation to fibrositis are those areas of induration usually known as fibrous nodules found in the fibrous sheaths and attachments of muscles, especially in the lumbar aponeurosis and the insertion of the deltoid. Sections of these have shown them to consist of fibrous tissue, hypertrophied and œdematous, the contained blood vessels showing periarteritis and endarteritis.

As regards ætiology I suppose a gonorrhœal infection is about the only cause which will receive universal acceptance. For my part I am satisfied that in some cases focal sepsis is responsible and I have seen several patients, subject to recurring attacks, lose them after an area of focal sepsis has been cleared. I am also prepared to accept Gower's opinion that people who are frankly gouty, are specially liable to fibrositis. But there are many cases to which none of these causes can be assigned.

The determining factor of a particular attack is often some sudden strain upon some muscular tissue, not necessarily a severe one. People who are liable to get this form of attack in the neck muscles, usually get their pain from turning the head suddenly in some particular direction. Fortunately the symptom complex when there is no joint or large nerve involved, usually responds well to various forms of local counter irritation such as will be discussed later and the immediate distress can be considerably mitigated by many of the analgesic coal tar derivatives.

The fibrositis with fibrous nodules I have found the most resistant of all to treatment. In one instance after I had exhausted all the ordinary forms of counter irritation, I quite empirically tried injecting the nodules with some colon bacillus vaccine as an aseptic irritant. The patient quite lost her pains after a few injections and six months later had had no recurrence, while the nodules, though still palpable, were much smaller and harder than before.

At present I have a very nervous patient under my care with six or seven elastic nodules almost like lymphadenomatous glands in the lumbar aponeurosis. She has resisted all forms of treatment. Recently she has been treated with diathermy and after five treatments feels a little better, though the nodules do not seem to have altered. She is temperamentally unsuited to treatment by local injections.

Before I leave the subject of fibrositis, some reference may be made to the interesting influence of changes of atmospheric temperature, especially a sudden fall in temperature and also to alteration in barometric readings upon inflamed fibrous tissue. It is well known that many sufferers from this type of disorder can forecast a change with even greater certainty than a meteorologist and that exposure to cold, especially in the form of a draught, is liable to be followed by a recrudescence of symptoms. It is possible that the alteration in the blood vessels already noted may play some part. When there is general vascular disease, we have many examples of similar effects, as in the tendency to anginal attacks when those subject to them go out into the cold, in attacks of Raynaud's disease and in paroxysmal hæmoglobinuria.

Arthritis.

When we come to the question of arthritis, we find ourselves upon a battleground and it will be

as well to dismiss from our discussion as briefly as possible all non-controversial types of cases, so that we can enter the arena as unhampered as possible.

Arthritis is of course a very wide term and includes inflammation of any or all of the joint structures, so that our review has to take in all types of disease of the periarticular structures, simple and purulent, as well as changes in the bony structures which may be atrophic or hypertrophic or a combination of the two. We can dismiss from further consideration purulent affections, as in these an infecting organism can practically always be discovered and the ætiology thereby established.

The fiield can be further reduced by excluding cases of trauma, gout, acute rheumatism and recognisable infections such as tuberculosis, syphilis and gonorrhœa, hæmorrhagic states such as purpura and hæmophilia and the injections of sera. Unfortunately we still have left a vast number of cases that will not fit in under any of these headings and it is these I purpose specially to discuss. Excluding suppuration every type of joint inflammation appears in this group, acute, subacute, chronic, periarticular, articular of the hypertrophic and atrophic types. Very often the three latter varieties are found together. To the laity all are rheumatism, but among the profession there is almost as little unanimity about terminology as about ætiology. The most popular medical terms are, I think, rheumatoid arthritis and *arthritis deformans*, while some physicians are so satisfied that one type of chronic joint change has a different—though unknown—origin from the rest, that they group these under the special heading of osteoarthritis. For my part I prefer the non-committal descriptive name of *arthritis deformans* and while I feel sure that in the fullness of time researches into ætiology will enable various subdivisions to be made from this heterogeneous collection, I do not feel that we are yet justified in claiming a distinct ætiology for the osteoarthritis group.

Though there may seem to be little in common between the ailment of an otherwise healthy man with a monarticular arthritis, such as the old time *morbus coxæ senilis*, and that of a wasted bedridden invalid with polyarthritis, we must remember that we meet with all gradations between these two. Indeed the true monarticular is very rare, as careful search usually reveals some other arthritic affection such as Heberden's nodes, grating in a shoulder joint and particularly, if the assistance of the radiologist is sought, some spondylitis.

It has long appeared to me that the general attitude of pessimism about the ætiology of *arthritis deformans* has resulted from the attempt to find a single cause for all types of cases. For my part I am quite satisfied that all cases are not due to the same cause and when I am consulted by a patient with this symptom-complex, I always tell him frankly that several different things may be causing these symptoms and that it is only by patient search and often after trying different remedies that a change for the better may be brought about.

I am firmly convinced that focal sepsis is the chief factor in many instances. How it acts is quite another matter. It seems to be clearly established that the organisms apparently responsible for the focal sepsis do not migrate to the joints and establish themselves there. Possibly the toxin of certain types of organisms or organisms growing in certain situations has a special affinity for joint tissues, just as diptheritic toxin has a special affinity for nervous tissues.

Whatever the explanation, I have seen several patients with well marked periarticular arthritis get well rapidly after no other treatment than the removal of a well defined septic area and in several very advanced cases characterized by bony changes such treatment has been followed by prompt amelioration of symptoms. Such sepsis has been most often in connexion with dead teeth showing well defined apical abscesses, but in one or two instances equally good results have followed the removal of really septic tonsils. I recall one patient who had gone steadily downhill for two years in spite of most diligent and diverse treatment, but who began an equally steady improvement immediately after the enucleation of tonsils described by the surgeon as simply pus sacs.

Before leaving the question of dental sepsis I wish to state that I am not one of those who advocate removal of the teeth as the preliminary treatment of *arthritis deformans*. Far otherwise, for I regard a satisfactory masticatory apparatus as of more than usual importance in this disease. It is my practice not to advise removal of any tooth in arthritis that I would encourage an otherwise healthy person to retain.

To the argument that often no improvement occurs after the removal of gross septic foci of this type, I would reply firstly that I do not regard sepsis as the only cause of the disease and secondly that I would remind you that though many patients with recurring acute rheumatism recover after enucleation of diseased tonsils, many others do not, but yet it is pretty generally accepted that diseased tonsils and acute rheumatism are often closely connected. Hurst has put forward the view that a duodenal infection may carry on the toxæmia after the mouth has been cleansed and finds hypoacidity to be the rule in these patients. When there is such deficiency the theory is very plausible, but in the patients that I have tested, the acid has been found below normal in less than half.

Another ætiological factor in which I have the temerity to believe, is disordered metabolism and my mental picture of such disorders would include not only irregularities such as incomplete synthesis of known substances such as nitrogenous waste products, but disturbances of biochemistry leading to the formation of complex toxic materials. Taking the latter suggestion first, I would remind you that the introduction of a foreign serum chemically identical with that of the recipient does often produce severe arthritis and also that we from time to

time meet with cases of *arthritis deformans* in which there appears to be a close relationship between exacerbation of the disease and gastrointestinal disturbances.

I am not now referring to the question of micro-organismal toxin being absorbed with the food, as I am purposely avoiding that well worn theory.

As an example of the type of case to which I refer, I may mention a patient who has been under my observation for some years with extremely crippling periarticular arthritis.

During the whole of the illness the patient has been subject to frequently recurring attacks of nausea, headache and vomiting. With each of these attacks there is an immediate recurrence of the arthritic symptoms accompanied by swelling and intense pain, sometimes in the small of the back and at others in the large joints. The pain is often particularly severe in the cervical region. The appendix has been removed and the gall bladder pronounced healthy. On three different occasions the radiologist has pronounced the gastrointestinal tract normal and a recent fractional test meal revealed a normal gastric digestion. In addition, focal sepsis has been diligently sought for and the question of food idiosyncrasy investigated—both without result.

Gout may be cited as an arthritis resulting from faulty metabolism of nitrogenous waste products and though the classical gouty toe is not suggestive of *arthritis deformans*, we occasionally meet with a multiple arthritis of this type in unmistakably gouty people. As an example I may quote a case of a man recently under my care.

He had been bedridden for twelve months with an arthritis involving shoulders, knees, ankles and fingers. The fingers were spindle shaped, the knees and ankles very swollen and painful and there was gross œdema of the legs below the knees. On the dorsal aspect of one thumb and two fingers there were enormous tophi, one of which had broken down. In addition he had a dry skin, myxœdematous facies, subnormal temperature and harsh voice.

He was given "Atophan," one gramme three times a day for four days each fortnight and salicylate of soda, iodine and colchicum when not taking the "Atophan." In addition he took 0.3 gramme (five grains) of thyreoid extract daily and had some massage and alternate hot air and ionization to his worst joints. In three months he was able to walk two miles without getting tired and returned to his home in the country satisfied that he was cured.

In the above case I regarded the thyreoid deficiency as a pure coincidence, but much as I deprecate the tendency to ascribe all human suffering to endocrine disorder, I do think that there are some grounds for believing that in certain cases of arthritis an inhibition or other alteration of endocrine supervision—to use a wide term—of joint structure may play a part. It is certainly a fact that at the menopause—a time when we are on fairly sure ground in maintaining that the endocrine balance is upset—some degree of polyarthritis is very common. I have seen many of the milder conditions completely clear up coincidently with the disappearance of the typical climacteric symptoms. In several other cases that have not terminated so happily, gross focal sepsis has been present.

It was at one time a well supported theory that *arthritis deformans* was due to disorder of the trophic nerves, but I think it is now generally accepted that this is at most a subsidiary factor. I think that where there is early and excessive muscular atrophy, there is neuritis due to the same toxin that is affecting the joints and that damage to trophic nerves explains the great rapidity with which the disease advances in the joints of paralysed limbs when those with arthritis suffer from cerebral vascular lesions. I also suspect that the Charcot's joints of *tabes dorsalis* are really examples of *arthritis deformans* appearing as a complication of this disease. I have in mind a tabetic at present under my care who has prominent Heberden's nodes on his fingers, a fully developed Charcot's knee joint and an incipient Charcot's ankle.

When we come to practical treatment, the lack of any lines of clear demarcation between different groups of cases makes it necessary to proceed with caution. Septic foci should be diligently albeit intelligently sought not only in the mouth and throat but in every part of the body and very thorough examination of the functional efficiency of all the organs carried out. No radical procedure should be carried out unless all the "pros and cons" are weighed. Where definite sepsis is present, cultures to determine the infecting organism should be made. If these reveal organisms likely to be playing a part, particularly I think hæmolytic streptococci, I always have a vaccine prepared. Before using it I usually wait to see what progress is made with general and local treatment after the sepsis has been eradicated.

I am of course aware that the value of vaccine therapy is much debated, but I have seen several stagnating cases improve remarkably immediately after vaccine treatment has been instituted. Therefore the fact that in other cases the results have been disappointing does not daunt me. Once started, vaccine treatment usually has to be persevered with for a long time in treatment of patients who improve slowly and an argument often raised against the treatment is the expense entailed. In my practice those who incur expense do it voluntarily, for I always encourage my patients to give the vaccine to themselves after the first few doses and I have not yet seen any ill effects from this method of administration.

For some time past I have been in the habit of having fractional test meals carried out in these patients and when there is gastric hypoacidity I have prescribed large doses of dilute hydrochloric acid. In some cases considerable benefit has resulted, but this has been by no means invariably the case.

To patients intolerant of the acid I have several times given a mixture containing two cubic centimetres of *liquor hydrargyri perchloridi* and one cubic centimetre of *tinctura feri perchloridi* half an hour before meals. In two cases in particular the improvement that followed was quite remarkable.

When there is very definite evidence of colon disorder such as distension of the colon and recurring diarrhœa, I still order that rather out of date remedy, milk soured by the *Bacillus lacticus bulgaricus*, and in a few cases the change for the better

in both bowel and joint symptoms has been evident that the patients have needed no encouragement to continue the treatment.

In those cases in which the evidence suggests to me that there is some metabolic disorder, especially of the gouty type and in others in which treatment on the above mentioned lines is not proving beneficial, I usually try the effect of 2-phenylchinolin 4-carbonic acid (commercially known as "Atophan"). My attention to this drug was first drawn by an article in the *Quarterly Journal of Medicine* in 1913 referring to some careful investigations upon its effect upon uric acid excretion. It was shown that it did actually raise the output of uric acid and that if uric acid is injected intravenously into a normal man, its excretion is spread over several days and the total amount fails to appear in the urine. But if the injection is given during a course of "Atophan," then the uric acid excretion is complete in twenty-four hours and the whole amount injected is duly voided.

In many cases quite extraordinary improvement follows the exhibition of "Atophan," but in others at best a purely temporary alleviation of pain results. Unfortunately it frequently so upsets the digestion that its use has to be abandoned.

When no specific indication for treatment can be found and in cases in which such indications have proved misleading,I think that intravenous shock therapy is always worthy of trial, provided the general condition of the patient does not contraindicate it. In my hands it has not proved the panacea that it would appear to have been when used by some others, but I have seen some excellent results. This applies especially to patients in the early stages of the periarticular form, but occasionally those in more advanced stages have been greatly benefited when this treatment has been combined with local treatment of the joints.

If there is any evidence of thyreoid insufficiency, I usually order thyreoid extract, cautiously increasing the dose to the limit of tolerance.

It is unfortunate that the laity is so obsessed with the idea that a low protein diet is an essential part of the treatment of all so-called rheumatic infections, for it is my impression that in all but the gouty type of cases benefit results from reduction of carbohydrates and increase in the proteins. Indeed I have suspected that much of the benefit that sometimes results from the hydrochloric acid treatment, is due to the increased appetite and desire for flesh food that often follows.

In the matter of local treatment I always advocate as free use of the joints as possible and discourage resting them except in acute exacerbations. I think this prevents muscular wasting and contractures. To overcome the disinclination for exercise that follows the morning stiffness, I often prescribe acetyl salicylic acid or other coal tar derivative to be taken before the patient rises.

Effusion of any size in the knee joints so hampers exercise that I always aspirate such joints and follow this with a Scott's dressing for a few days. I have had several cases in which a few aspirations have led to complete cessation of this symptom and thereafter the knees have proved the least troublesome of all the joints.

When patients are in hospital or can afford it privately, various forms of counter irritation such as dry heat, ionization, violet rays, combined with massage and passive exercises are of great benefit. Some do better with one form, others with another. My experience with diathermy is very limited and I hope to learn more about its practical use tonight.

Poor people in their own homes often derive benefit to their hands and feet from the use of alternate hot and cold applications—two basins of water often provide a useful means for this treatment.

Bier's method of passive congestion by means of elastic bandages is useful for the larger joints and patients soon learn how to carry out this method intelligently.

A good night's rest can often be secured if the patient has a hot salt bath before going to bed, especially if after the bath the most painful joints are swathed in lint well buttered with 20% ichthyol ointment.

THE PLACE OF DIATHERMIA IN THE TREATMENT OF CERTAIN CHRONIC CONDITIONS SUCH AS SCIATICA, FIBROSITIS AND ARTHRITIS.[1]

By J. W. Hoets, M.B., Ch.M. (Sydney),
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It is with diffidence that I venture to speak of conditions such as those set down for discussion tonight as I feel sure that every one will be agreed upon the extreme difficulty of benefiting a large proportion of patients suffering from them. However, it has been my privilege during the last twelve months to have charge of the treatment of a fair number of such patients in the Orthopædic Department of the Lewisham Hospital and to observe the effects of diathermy. The belief that the majority of those patients having this particular form of treatment have been definitely benefited thereby induces me to submit these remarks for your consideration.

The Nature of Diathermy.

First I shall briefly state what diathermy is and what it does. Diathermia, diathermy, endothermy, thermopenetration *et cetera* are synonymous terms signifying the heating throughout its entire thickness of the tissue or tissues included between two electrodes by the passage of an electric current of relatively high voltage and low ampèrage, but alternating at an extremely high frequency.

This effect is produced by portion of the electrical energy being converted to heat in the tissues by their own resistance to the passage of the current. Consequently the degree of heat will vary as the resistance in the different tissues. It is to be noted that heat only is aimed at. There should be no

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on August 27, 1925.

faradic or polarity effect owing to the nature of the current, that is one alternating at extremely high frequency—about a million a second. Should the patient experience any pricking or stinging sensation or should there be any muscular twitching or in fact any result other than a gradual and gentle warming of the part, then the machine is out of tune or the electrodes are not properly applied. The determination of the heat to the tissue which it is desired to treat, is a matter of technique upon which it is not necessary to dwell now, except to mention that the intensity may be varied from a slight local rise of temperature to one sufficient to cause destruction. For convenience of description sometimes the terms "medical" and "surgical" diathermy are used to denote: (i.) the warming of the part under treatment only so far as to produce an active hyperæmia or (ii.) the raising of the temperature to such a degree as to produce coagulation and destruction. I shall refer to so-called medical diathermy only.

Description of Apparatus.

Machines of various make are on the market, all the same in principle, perhaps the main differences being the type of spark gap—the vulnerable point—which must be in perfect order for good and uniform results.

Electrodes are of various materials such as metal plates, bare or covered with pads of lint soaked in saline solution, saline solution for immersion of the part, clay slabs moistened with saline solution *et cetera*, the essentials being that they shall be wet and shall be in perfect contact with the skin. I find twenty-two gauge malleable metal plates well lathered with soap emulsion to be very satisfactory, being convenient, safe and easily sterilized by boiling. The size is determined by the part to be treated and the degree of heat required. For a knee joint, for instance, the two electrodes will be of equal size, about 7.5 by 5 centimetres (three inches by two inches) and placed either one on each side or one in front of and one behind the joint. Sometimes, particularly in "surgical" work, the electrodes will be unequal. Then the tissue under the smaller of the two will be affected much more than that under the larger because the same current is carried on each and the heat produced will be greater where the current density is greater, that is under the smaller electrode. With any pair of electrodes the heat under each varies inversely as the square of their area. In "surgical" diathermy this difference in size is very great, the smaller or active electrode being reduced in size to a point or an edge, the larger or inactive one being placed at a distance from the operation area and producing no effect at all clinically.

Changes Produced in the Tissues by Medical Diathermy.

As a result of the rise of temperature there is a vasodilatation of the part under treatment with increased amount of blood circulating locally. This increased flow of blood carries off into the general circulation an amount of heat varying with the vascularity of the part, so that there is a secondary effect gradually produced if the current is passing for a long period, that is a raising of the general body temperature. This secondary effect is not in evidence with treatments of from twenty to forty minutes as a rule. It is the local effect—an active hyperæmia in the affected tissue—that is practically the sole physical result of the application in such conditions as we are considering. There may be some electrical effect on the cells and one reads of "cell massage" by the rapid oscillations of current, but whether this is worth considering I cannot say. This local hyperæmia softens fibrous tissue, helps to remove "tissue *débris*" and in fact starts or aids the natural repair process. This is the theory and it is found in actual practice that results justify the theory, provided certain facts are borne in mind. For instance it must not be expected that a joint, the site of an old inflammatory reaction of years before, with definite articular and periarticular changes, held in faulty position and almost rigid with dense fibrotic adhesions and contractures, is going to respond to any great degree to a few applications of half an hour each. Maximum benefit indeed will not be obtained possibly for months. I have one patient who has been under treatment for six months and who in that time has recovered almost 90° of movement in a knee practically rigid and further is still improving.

I wish particularly to emphasize this point, namely, that maximum benefit particularly in chronic conditions will obtain only when the treatment is regular and sustained for some weeks at the very least. Why this must be so I will try to show.

Indications for the use of diathermy may generally speaking be said to include all conditions in which it is desirable to produce an active hyperæmia. The one above all others is pain.

Contraindications are practically absent in chronic cases. With acute inflammation pus in an undrained cavity is definitely a contraindication. Occasionally during the course of treatment a great increase in pain will occur following a period of temporary relief, so great may this increase be that patients have at times refused further treatment. These acute exacerbations of pain are puzzling, but I believe them to be due to the irritation of increased movement. This increase has been made possible by previous treatment breaking down or stretching adhesions between the nerve and surrounding parts or bringing into use more of a joint surface. Clinically there is almost always a definite subsequent improvement.

It is worth noticing that heat applied in various ways is the most commonly used and beneficial of all remedies for pain. The difficulty is usually to get the heat to the part desired. The poultices, hot water bag, hot iron and so forth heat the skin even to blistering, but beyond some reflex vasodilatation the deeper structures are not affected on account of the excellent protection offered by the skin and blood supply of the parts beneath. In diathermy the heat is conversive not conducive, that is, it is electrical energy converted to heat in the tissues themselves.

Sciatica, Fibrositis and Arthritis.

I am trying to indicate the place of diathermy in the treatment of certain chronic conditions such as sciatica, fibrositis and arthritis, not because it is by any means limited to such, but rather because I have had many personal disappointments in the treatment of them and feel that any method which can give fair promise of improvement will be welcome. Although sciatica cannot be considered a distinct entity still it is such a common label for a variety of conditions that I have mentioned it specially. These three seem to fall into a group naturally, first because they are extremely troublesome alike to doctor and patient, but apart from this they have common ætiological and pathological factors. The prognosis in all is uncertain, they have symptoms in common, namely pain and disability and finally treatment is difficult and often disappointing.

Ætiology.

Predisposing causes are trauma and exposure. The direct causal agent is probably always a toxin either chemical from faulty metabolism as in gout or diabetes or bacterial following general infection such as enteric or influenza or from a concealed focus as from infected teeth, tonsil, sinus, antrum, bowel, gall bladder, prostate or tube.

Pathology.

The affected structures have a preponderance of fibrous tissue where, according to Osler and McCrae:

> The essential lesion is probably of an inflammatory nature. There is a serous exudation in the affected parts which later may be followed by a proliferation of the fibrous tissue. . . . This . . . . may extend over a considerable area. The small vessels show periarteritis and endarteritis. . . . . The changes suggest either chronic low grade infection or the influence of toxins.

The great sciatic nerve, having a large amount of fibrous tissue in its sheath, is particularly prone to such changes producing the immediate cause of pain, that is pressure. In lumbago, stiff neck and generally in so-called myositis the actual tissue in trouble is the fibrous tissue surrounding or dipping between the muscle bundles. Excluding specific infections such as tuberculosis and syphilis, chronic arthritis in the majority of cases will be a manifestation of one of the various types of *arthritis deformans* and the fibrous tissue in either the synovia, capsule or periarticular structures will bear the brunt of the inflammatory attack and will be the site of most of the changes produced.

The outlook must be bad under these conditions as resolution of the serous exudate or softening of the proliferating fibrous tissue cells will depend on the amount of blood circulating locally once the primary cause has ceased to operate. But the greater the amount of fibrous tissue and the greater the length of time since it was laid down, the greater the relative anæmia of the part since its tendency is always to contract and shut off its own blood supply.

Symptoms.

The symptom common to all is first and foremost pain. Pain which may last for weeks, months or years, may defy all attempts at relief. This may and often does alter the whole outlook of the unfortunate sufferer and convert him into a melancholic or drug addict. Added to the pain is the disability. This is not so lasting as a rule in sciatica and fibrositis, though while it does last it may be absolute, but in *arthritis deformans* it is a disability generally progressive and lasting for the duration of life. One of the most tragic features of this latter disease is the early age at which it often attacks.

Diagnosis.

Diagnosis as always is of the utmost importance, not so much to determine the exact site of the lesion, whether for example in synovia or capsule, but to unearth the focus of infection with its factory of toxin often so concealed that the patient may have literally to be pulled to bits in the search. Sciatic pain may be due to posterior root ganglionitis, pelvic tumour, arthritis of hips or spine or other conditions the possibility of which must be borne in mind. I repeat—teeth, tonsils, sinuses, gastro-intestinal tract, prostate and seminal vesicles in the male and the internal genitalia in the female are suspect until something definite is found, nor must one forget the frequently present symptomless bacilluria.

Treatment.

I do not propose to speak of treatment other than that form which is the subject of this paper, except to say that in such crippling conditions reliance should not be placed wholly on any single method. I have tried to show first by describing what diathermia is and does and then by outlining the origin and result of these pathological states that here we have a form of treatment which should be of great help in bringing about a softening and relaxation of fibrous tissue by the active hyperæmia it produces. It thus eases pain and promotes restoration of function up to that point at which bony changes render further improvement impossible without surgical intervention. That it does so has been abundantly proved clinically provided always that the method is used conscientiously and under careful medical supervision. To neglect its use is, I contend, to lose the aid of the most powerful single factor in the restoration of damage already done and prevention of further disability.

In sciatica, uncomplicated by pelvic tumours or joint changes, I can confidently assert that diathermy brings relief more quickly and permanently than any method I have seen tried. Relapses do occur, but as a rule yield quickly to further treatment. The plan of attack in such cases is first to warm the nerve roots and sacral plexus by electrodes back and front and then the nerve in its length by applying one over the sacroiliac region and the other on the sole of the foot. Treatments are given daily at first lasting from twenty to forty minutes and usually after two or three there is experienced

definite relief. The length of time required for complete relief varies from two weeks to two months. Fibrositis responds better as a rule when diathermy is used in combination with a monopolar high frequency discharge.

Chronic arthritis offers so varied a picture and such a multitude of lesions, many of them often present in the same patient, that the difficulty is to find time to give a reasonable amount of attention to the various joints. In these vexatious cases an endeavour is made to prevent further deformity by appropriate splinting in the joints already damaged and where the inflammatory process has subsided and to turn attention at first to the more recently involved and by conversive heat to help resolution before deformity occurs. This is carried out concurrently with the search for and treatment of the focus from which the toxin comes. The earlier affected and stiffer parts can be dealt with later. When the disease is affecting only one or two joints more time can be given and the amount of restoration of function, to say nothing of the relief of pain which can be brought about in a month's treatment, is frequently very pleasing. When X ray examination shows great lipping of joint surfaces or cartilage practically absent with fibrous or bony ankylosis the most one can hope for is relief of pain to a greater or less extent and this hope is almost unfailingly realized.

Conclusion.

Diathermy is a method of treatment which is of very great use in all conditions characterized by inflammation and increase of fibrous tissue. It often relieves pain with surprising rapidity and is instrumental in restoring a large amount of function which would otherwise be lost. It acts by producing an active hyperæmia in parts deficient in blood supply. The maximum effect is obtained only after fairly lengthy periods of treatment which should be persisted in as long as improvement continues.

Case Records.

In support of my statements I will quote statistics of patients treated by diathermy at Lewisham Hospital since the beginning of the present year (see Table) and read one or two case histories.

I do not propose to weary you with a long series of histories, but will ask you to allow me to read several illustrating typical examples of chronic sciatica, fibrositis and arthritis and showing the definite place occupied by diathermy in the management of the case, that is that of easing pain and restoring function, once the exciting cause has either ceased to operate or has been removed.

Sciatica.

Case I.—J.H., aged sixty-one years, grazier, had a first attack of sciatica in 1891, about thirty-three years ago. He was then laid up three months. He had never been completely free of pain since, but fairly well until two years ago when he was laid up for a month. The present attack began twelve months ago. He had been laid up almost the whole of that period and had had a variety of treatment including several weeks at Moree from which he derived considerable benefit. He was still confined to bed.

Table, Showing Results of Treatment at Lewisham Hospital.

Disease.	Cases.	Number of Treatments.	Average Number of Treatments.	Patients Cured.	Patients Relieved.	Patients Unrelieved.
Arthritis deformans ..	37	857	23	—	32	5
Arthritis, septic	3	157	52	—	2	1
Neuritis (other than sciatic)	14	291	20	4	10	—
Sciatica	13	248	19	10	3	—
Trauma, acute	3	34	11	2	1	—
Fibrositis	13	275	21	8	5	—
Postoperative conditions	7	97	14	1	6	—
Fracture sequelæ ..	7	117	18	3	4	—
Hysteria and Neurasthenia	3	66	22	—	3	—
Others	8	96	12	2	2	4
Totals	108	2,248	20	30	68	10

On examination he had definite tenderness along the course of the sciatic nerve and over the lower third of the leg, also over the sacro-iliac and hip regions. X ray examination of the pelvis revealed no abnormality. Urinary and gastrointestinal tracts were normal. Nasopharynx and teeth were clear. The causal agent was undiscovered. Possibly it was a general infection previous to first attack.

After three weeks diathermy he was practically free of pain except for that about the ankle. After five weeks he left the hospital walking well and free of all pain.

A report received recently about ten months after treatment ceased is to the effect that beyond a slight attack which cleared up quickly under diathermy in another State, he has remained well.

Case II.—F.M., aged forty-five years, a clergyman, had enteric fever five years ago with left femoral thrombosis. About two years ago he had an acute attack of sciatica which laid him up for ten weeks in hospital. He had not been free of pain for a day since, but was able to walk a little and even run. Eight months ago he had a very severe attack and was laid up for ten weeks, the pain being most severe in the calf of the left leg. He was operated upon and a "nerve removed." Pain has never been absent and he was gradually getting worse until I saw him when walking was impossible.

On examination the gluteal region appeared flattened, a scar was present on the postero-lateral part of upper third of leg. He was very tender over the course of the sciatic nerve. No focal infection was discovered. The enteric five years previously was considered responsible.

This patient was under treatment from October, 1924, to March, 1925, having ninety-three applications in all. In December, 1924, his pain had completely disappeared and he was able to walk a mile without discomfort. He remained thus for a week when the whole trouble returned with all its old severity. In this case the relapse did not, as it generally does, clear up quickly, but took practically the same time as the original course of treatment. Since his discharge on March 18, he has remained well and reported personally last week that he had no return of pain.

Fibrositis.

Case III.—C.J., aged thirty-two years, a moulder, after an attack of gonorrhœa four years ago developed pain in the back which has been troublesome on and off since. During that time he had a spell of nine months free from pain. The present attack began two months before I saw him and was getting worse till he had to give up work one month later.

A fruitless search was made for gonococci after prostatic massage. No other possible source of infection was found. X ray examination of joints revealed no abnormality.

Twenty-five treatments were given in two months when the patient was free from pain for nearly a month and able to touch his toes and straighten up without any inconvenience.

Arthritis.

CASE IV.—F.H., aged fourteen years, a schoolboy, had a fall from a pony two years ago and one year later had a pain in the right knee. One month later in hospital he had an abscess opened in his groin. He was in bed three months after operation with knee and hip semiflexed. On getting up he found he could not move his right hip joint at all.

On examination the right hip was rigid, the left had a fair range of movement. X ray examination revealed the head of femur and acetabulum on both sides irregularly eroded and hazy. No active focus was found.

Treatment has been continuous since he came under observation in March of this year and improvement has been slow but steady. He can now walk, run a little, kick a football with either foot and assume a crouching position which is a source of great satisfaction to him as he keeps wickets for his school. Diathermy precedes his exercises and he feels much freer immediately after a treatment.

CASE V.—J.R., aged twenty-one years, a farm labourer, after gonorrhœa eight months ago, complained that the right hip became very stiff and painful on movement. He was unable to move without the support of two sticks and with these progress was very painful and slow.

On examination by X rays lipping and erosion of right acetabulum with absorption and overgrowth of elements of sacroiliac joints were found. No active focus being discovered, the condition was ascribed to the attack of gonorrhœa.

Treatment by diathermy and active and passive movements was instituted and continued till he was obliged to return to the country for private reasons. He had one hundred and five treatments and on leaving was much improved. He had much less pain and was able to get about fairly well with one stick.

CASE VI.—S.L., aged thirty-five years, a teacher, has had stiffness, pain and swelling of both knees for five years. She had appendicectomy and a septic tooth removed three years ago followed by a definite subsidence of symptoms, indicating one of these as the cause of her trouble.

X ray examination revealed osteoarthritic changes in both knees. There had been no progression in the disease since the operation.

Treatment gave rapid results. Pain, swelling and tenderness disappeared entirely after thirty-six treatments when she was walking without a limp for the first time in five years.

The point about these cases in which you see definite bony changes, is the improvement as regards both pain and function when the fibrous tissue in the capsule and periarticular structures is softened in spite of the condition of the joint surfaces.

MUSCULAR MOVEMENT AND ITS REGULATION.[1]

By F. WOOD JONES, M.B., F.R.S.,
Elder Professor of Anatomy in the University of Adelaide.

WE know that one of the great functions of living protoplasm is the manifestation of movement. The movements of a unicellular animal, such as *Amœba,* are familiar to everyone and it might be asked by one with an enquiring mind if, when in a multicellular animal certain cells are set apart for producing movement, this movement is produced by the innate mobile quality of protoplasm or if some new outside influence is needed to produce the movement of the cell. Are the cells, known as muscle cells, things that possess an innate protoplasmic ability to move or is it necessary that some outside influence, such as that brought by a nerve, must react upon them? Is movement in a muscle cell myogenic in origin or is it a thing for which an outside stimulus, as a nerve impulse, is an essential forerunner?

From our knowledge of the muscle cells of the developing heart we are bound to admit that primarily the movement of a heart muscle cell is myogenic in origin; for it is well known that heart muscle starts upon its function of rhythmical contraction before its supplying nerves have made connexion with the contractile cells. Isolated embryonic heart muscle when cultivated outside the body also shows this contractility which is altogether independent of nerve supply. With other visceral muscles the same facts appear to hold true. Strips of visceral muscle, isolated from their nerve supply and treated with nicotine of a strength which insures the paralysis of sympathetic synapses, will continue to make spontaneous movements for a very long while when removed from the body. Despite the recent investigations undertaken by Dr. O. W. Tiegs in Melbourne there seems no real alternative to assuming that the movements of heart muscle and visceral muscles may continue in the absence of a nerve supply and be truly myogenic in character.

Even when we come to those striated, skeletal, somatic muscles, incorrectly termed voluntary, there would seem to be some well authenticated facts which make it difficult to reject the possibility of myogenic movement at this advanced stage of development. Those strange cases, collected by Ballantyne, in which anencephalic fœtuses, born alive, have been seen to make movements of the eyes and face, in the apparent absence of any part of the brain or nervous system connected with these muscles, seem to point to a myogenic activity of the voluntary muscles of expression. There are even cases in which malformed fœtuses which appear to be entirely lacking a spinal cord, have yet evinced a wide range of muscular movement.

We may, therefore, have to admit that primarily in the case of all muscles there is a possibility of movement being myogenic in origin. We may have to postulate that all muscles possess an innate power to move regardless of a nerve supply. If this is so, we may also have to agree that nerve supply is not primarily granted to a muscle to create movement, but to regulate and control it. So far we seem to be following a very natural line of thought; but we shall also have to admit that, once a muscle has achieved its nerve supply, it tends to become dependent upon its nerve supply not only for controlling and regulating its movement, but for initiating its movement. Obviously there is a gradation in these things, some types of muscles are more dependent upon their nerve supply than others.

[1] Read at a meeting of the South Australian Massage Association on September 23, 1925.

Some show a relative independence and even in the adult may demonstate myogenic movement. Some are utterly dependent and in the absence of a nerve supply become permanently inactive and finally cease to be capable of movement, no matter what stimulus is applied to them.

We have, unfortunately, an accepted but extremely incorrect classification of muscles. This classification has become stereotyped in textbooks and its use has become habitual, although its shortcomings are obvious to the majority of those who employ it. It is a great mistake to permit even in thought any distinction to be made between what are termed "voluntary" and "involuntary" muscles. There are voluntary and involuntary actions, but the terms, when extended to the muscles which perform the actions become entirely fallacious.

There are grades of muscle structure and these grades of structure correspond to grades of function. There are muscles that perform slow, unprecise, often rhythmical actions and which show those histological characters that are grouped under the term "unstriated" or "visceral" muscles. There are muscles that perform quick, precise and sharply limited actions and these have the histological characters summed up in the terms "striated" or "skeletal" muscles. There are grades of striation and unstriation as there are grades of function from short, sharp, precise actions to lazy, generalized and unprecise actions. In general it is true that in man the muscles that perform the precise actions, are brought under the influence of what we term our will, whilst those that perform the slow unprecise actions, regulate movements termed involuntary. But this is only a generalization. When we sneeze, we employ a wide series of striated—so called voluntary—muscles in an involuntary action and various unstriated—so called involuntary muscles—can be brought under the influence of the will.

Now, even if we are considering the nerve supply of a muscle as given for the regulation and control of movement and not for its initiation, it is obvious that there is a grading in the method of achieving the regulation. And this grading of the regulating nerve supply corresponds to the grading of the function of the muscle. Those muscles that have as their function the performance of rhythmical and somewhat slow movements are for the most part muscles that must act if we are waking or sleeping, if we are conscious or unconscious and if we are capable or incapable of regulating any bodily function from our higher nervous centres.

For these muscles there is a separate system of nerves of control and the whole making of the sympathetic system would seem to mark it out as a part of the nervous system that creeps away from the central mass in order to become as independent of it as possible. It would seem that in thus achieving its partial anatomical freedom it had attained its partial functional independence. It can regulate these muscular mechanisms when the rest of the nervous system is in abeyance. The central nervous system need not be bothered to regulate or initiate the muscular activities of the viscera, for the sympathetic system has, so to speak, crept away to take charge of this on its own account. Our higher central nervous mechanisms may sleep, but the regulation of the musculature of our viscera is continued by the sympathetic nerves. The heart continues to beat and to be regulated, the hollow viscera are controlled by the sympathetic system, though sleep or unconsciousness places the higher centres in abeyance. Now it is necessary to note that the innervation of the hollow viscera is a dual one. The control is shared between the sympathetic and the so-called parasympathetic system of nerves. In the exercise of this control the influences of the two systems are antagonistic. Under the influence of the sympathetic innervation the muscles of the hollow viscera adapt themselves to the contents of the viscera and permit of filling, at the same time contraction of the sphincters is brought about so that the contents to which the muscular walls have adapted themselves, are retained.

Under the influence of the parasympathetic innervation the muscles of the hollow viscera contract on the contents, the sphincters are relaxed and the contents are passed on. We have long been accustomed to the realization of the fact that visceral muscles have a double source of nerve supply, in both cases a nerve supply largely outside the sphere of influence of the higher centres of the central nervous system. It is, however, to be noted that even in the case of the visceral musculature the sympathetic supply is that which is most necessary in the abeyance of the central control. The parasympathetic is that which is more appropriate to the waking activities of the animal. The hollow viscera may fill during the quiescence of the higher centres, their emptying is a function more atune with a regulated, waking, considered control.

When we come to deal with the skeletal muscles, however, the innervation is carried out by the spinal nerves of the central nervous axis. The grading of muscle function and structure is accompanied by a grading of nerve supply. Even in the mechanism of somatic innervation this same grading is seen; for there is exhibited a graduated series of levels in the central nervous system at which the initiation and control of muscular movements are carried out. We know that primarily a very large share in the initiation and control of skeletal muscular movement is allotted to the motor cells of the spinal cord. With increasing perfection of the animal type the great initiating and controlling centre for skeletal muscular movement becomes transferred to a higher level and the *corpus striatum* assumes its rôle as the dominant seat of motor functions. The striate body may be termed the paleodynamic centre of the typical vertebrate brain.

There is still another change to take plcae before we arrive at the condition characteristic of the human mechanism for initiating movement. The paleodynamic centre yields its functions to a still higher level for the initiation of all those movements that we term inadequately as voluntary. The quality that is lodged in the so called motor cortex—the neodynamic or highest level of control of skeletal

muscular movements—needs more precise definition than that contained in the connotation of the term voluntary.

In the post central or so called sensory cortex there is lodged, so far as our own bodies are concerned, a discriminative knowledge of the parts of our body as entities occupying relations in space. Mere affective sensation finds its functional cerebral seat in the thalamus—the paleo-sensory centre, but discriminative sensibility which when applied to our own members results in a realization of their spacial relations, is lodged in the post central cortex or neosensory area. What we can effect in the way of movement by the intervention of our neodynamic or cortical centre is dependent upon what is realized in our neosensory cortical area. We may, therefore, say that the neodynamic area of the cortex has taken over the initiation of movements of those parts, the projection of which in space is represented in the neosensory area. If we cortically realize the projection of a member as an entity occupying spacial relations, then we can cortically dictate an alteration of its position in space. This basis of the cortical mechanism of human initiation of so called voluntary movements is important and to this subject we shall have to return.

Now, if movement is effected in skeletal muscles from the centres in the spinal cord, from the *corpus striatum* or from the precentral cortex, it is carried out by the route of the cranial or spinal somatic nerves. Teaching has become stereotyped in this respect; we do not look for any addition to the somatic spinal nerve supply of skeletal muscles, we have become so accustomed to the assumption that when the spinal supply is demonstrated all has been said with regard to the nerve supply of a skeletal muscle. But, having regard to the visceral muscles, we might ask: Why should one type of musculature receive a dual innervation and the other type be controlled by a single source of nerve supply? Why should not striated skeletal muscles be under the control of a dual innervation? That striated muscle does in fact receive a dual nerve supply, spinal and sympathetic, is an old thesis. It dates back at least to 1879 when Tchiriev demonstrated the fact that non-medullated as well as medullated nerve fibres entered into the supply of skeletal muscles.

That the non-medullated fibres are in reality sympathetic in nature has been abundantly demonstrated and after the beautiful work carried out by the late Professor Kulchitsky (1924) no dissentient voice is likely to be raised against the teaching that ordinary skeletal muscles receive both spinal and sympathetic nerve terminations and that no individual fibre receives both types of innervation.

A skeletal muscle as an anatomical entity is a composite of fibres some of which have a spinal nerve supply and others a non-medullated, sympathetic innervation. So much we seem to be forced to admit. The question now arises: How are these two innervations related to each other in the functioning of a muscle? This question, again, is not a new one. In 1913 de Boer cut the white *rami communicantes* running to the lumbar plexus of one side so as to deprive the leg muscles of their sympathetic innervation. He used frogs in his experiments and after the section of the *rami communicantes* the frog was suspended by a hook through the nose. When the suspended frog performed movements with its hind limbs, the limb which was deprived of its sympathetic nerves dropped back to a lower level than that maintained by the leg with an intact sympathetic supply.

As a result of these experiments de Boer concluded that after section of the sympathetic nerves tone was lacking in the muscles and that, therefore, whilst movement of skeletal muscles was subserved by the spinal supply, the sympathetic supply was responsible for the maintenance of tone.

Despite the older and the very well verified teaching of Sherrington that the tone of striated muscle was due solely to its somatic supply, many clinical observers leaned towards the newer findings of de Boer.

Nevertheless, Dusser de Barenne only three years later showed that in de Boer's experiment the element of shock accounted for some of the loss of tone, for although a de Boer frog manifested a complete loss of tone soon after the operation, this loss of tone was only partial when shock had passed off. In 1915 Langelaan repeated de Boer's experiments and his final conclusions appeared in 1922. He found, as had de Barenne, that the de Boer frog showed only a partial loss of tone when shock was recovered from and he set himself to determine exactly what was the nature of the loss.

There is a quality of muscle which Sherrington had previously studied exhaustively and had termed "plasticity." This quality of plasticity is displayed in the fact that a muscle remains at the length which has been imposed on it by a movement. It does not shorten like an elastic band after it has been elongated by a movement, nor does it elongate like a coiled spring after it has been shortened by a movement. Plasticity of muscles permits of their deformation by movement being permanent when the contraction or elongation accompanying the movement has come to an end. Contractility of muscle produces movement, plasticity of muscle permits of the movement terminating in a posture. In the de Boer frog the contractility of the muscle remains unimpaired, it is the plasticity and the tone underlying it, that are lost. It was Langelaan's work that showed that plastic tone was lost after the sympathetic innervation was removed from the skeletal muscles. The property of contractility persists in the de Boer frog although plasticity is lost. The animal can move its limb, but the position produced by the movement is not maintained when the movement has terminated. It can raise its dependent leg, but, when the movement is over, the affected leg drops back further than the unaffected leg. It still possesses contractile tone, but has lost plastic tone or, using a different terminology, it possesses dynamic tone and has lost static tone.

Langelaan next proceeded to the converse experiment of dividing the spinal nerves to the leg of a

de Boer frog and showed that again, when shock had been recovered from, there was still a remnant of tone in the muscles—he had destroyed contractile tone but a residue of plastic tone still persisted. In the frog, therefore, the experiments of Langelaan have made it apparent that, of the dual innervation, the sympathetic component subserves plastic tone and the spinal component subserves contractile tone. So far the facts seem definite.

There is another aspect of the dual innervation of skeletal muscle. In the original observations of Tchiriev in 1878 it was noted that the non-medullated nerves terminated upon thin, and the medullated nerves on thick muscle fibres. It was in consequence of this relation that Tchiriev concluded that the non-medullated nerves and the thin muscle fibres were merely developmental stages of the classical thicker fibres and medullated nerves.

Ranvier in 1884 continued the study of the individuality of muscle fibres and showed that the thin fibres were relatively poorly striated, and the thick fibres were well striated, that they differed also in colour and that the one type gives a slow prolonged contraction and the other a rapid short contraction. There is, therefore, a duality of structure, of nerve supply and of function in the constituent fibres of a skeletal muscle. There are thin fibres, innervated by the sympathetic, subserving the function of plasticity and thick fibres, innervated by the spinal nerves, subserving the function of contractility. Such is the conclusion arrived at by piecing together the findings of investigators over an interval of less than half a century.

Such was the conclusion arrived at when the late Professor Hunter, of Sydney, turned his eager mind to the subject. Hunter became a strong advocate for the truth of this thesis and the bulk of the papers produced during his short working life deal with one or another of the aspects of this question. He attempted to determine the nervous centres concerned in this dual innervation and dual control. He came to the conclusion that contractile tone depended upon the integrity of the vestibulo-spinal tract from Deiter's nucleus to the anterior horn cell and that plastic tone depended on the integrity of the ponto-spinal or reticulo-spinal tract from a cell of the *formatio reticularis* of the pons to the cell of the lateral horn and so by a white *ramus communicans* to the sympathetic ganglion cell. As a result of his experimental work on cutting the sympathetics to the limbs of decerebrate goats he took a great step—a step which is the aim of all real investigators—he sought to make his knowledge serve in the relief of the disabilities of his fellow men. With Dr. Royle, of Sydney, he elaborated the operation of ramisection, or division of the sympathetic nerves, to limbs showing that condition of spasticity in which an excess of plastic tone is evident.

It is this extension of the experimental work on animals to operative procedures on man that I want to review, not in the light of results obtained, but from the point of view of the philosophic application of some considerations of the conditions of human muscular control. It may be said that the work reviewed has demonstrated the basal uniformity underlying all innervation of muscle. Skeletal or visceral it matters not which, the innervation is always a double one, derived from the sympathetic and the parasympathetic or from the sympathetic and the spinal nerves. In the case of the visceral muscles, both sources of innervation achieve the production of movement. In the case of the skeletal muscles the spinal innervation alone produces movement, for (with the doubtful exception of Vulpian's phenomenon manifested in twitchings of tongue muscle produced by a probable sympathetic stimulation) the sympathetic influence is incapable of producing movement. In visceral muscle the dual innervation is antagonistic in the effects produced by stimulation; in skeletal muscle the effects are not antagonistic, but are rather complementary. In visceral muscle the influence of the sympathetic innervation is of vital importance, in skeletal muscle the sympathetic influence is of very minor consequence. Even in the de Boer frog the importance of the sympathetic innervation is not great when compared with the dominant utility of the spinal innervation. The frog can hop and its only disability is that the affected limb sprawls somewhat when it alights. It can swim and its only imperfection is the dependence of the affected limb which causes it to float unevenly. It would seem that, though the sympathetic still supplied skeletal muscles, its importance had considerably waned. It would seem that its waning was correlated with the grading of the function of muscles and the site of initiation of the impulses for their control. With those muscles that have received a spinal nerve supply, this spinal innervation is obviously of predominating and increasing importance and the sympathetic is proportionately becoming subordinated. If the spinal cord is divided, the sympathetic supply of the hollow viscera becomes dominant in consequence of the loss of the parasympathetic innervation. In such a condition the hollow viscera fill, their walls become adapted to their contents and the sphincters remain contracted. There is no corresponding manifestation of overaction of the sympathetics in the case of the skeletal muscles.

Far more important than any consideration of the obvious waning of sympathetic influences are the great questions relating to the difference in the quality of movements in man and in the lower animals. In man the importance of the initiation of so called voluntary movements from the precentral cortex lies in the fact we have previously noted—the movement of a part dictated from the highest centres is an outcome of the realization of the spacial relations of the part. I do not know the spacial relations of my pyloric sphincter; I cannot control its movements, nor dictate that they shall be initiated. Having no cortical area for a knowledge of my intestinal canal, because such knowledge cannot become cortical, I have no cortical area for initiating its movements.

Human voluntary movements consist in the cortical initiation of alterations in position of parts, the position in space of which is appreciated in the cortex. Now probably this human cortically initiated movement is a thing very different from the movements of such an animal as a frog or even a typical mammal. In the one case posture and movement are inseparable concepts, the realization of posture is a necessary part of the mechanism of initiating movement; posture precedes and results in movement. In the other case, posture and movement are separable, a realization of posture is not demanded in the initiation of movement; movement precedes and results in posture. Hunter has postulated that "the somatic arc determines the position assumed, the sympathetic arc maintains the position once it is assumed." For the frog, Langelaan has shown this to be true and doubtless it is true for the whole of the vertebrates including the typical mammals. But there is that quality of the human realization of posture which forbids one to believe that when a position has been assumed, it is maintained by the sympathetic arc. Were human posture to be maintained by the sympathetic arc, then a patient upon whom ramisection has been performed, should like the de Boer frog lose the posture the moment the movement has been effected. When the contraction tone has passed off, the limb should fall back again as does the frog's leg. There is in human posture and movement such inseparable unity, that I am inclined to think they cannot thus be sundered by the loss of the sympathetic innervation. The human cortex has usurped and unified too much to justify this expectation.

Reports of Cases.

COMPLETE TRANSPOSITION OF THE VISCERA.

By Bertrand Maguire, M.B., Ch.M. (Sydney),
Ashfield.

Recently I was called to see a patient, Mr. A, aged fifty-nine years, complaining of abdominal pain and distension. During a routine examination the following facts were discovered:

The apex beat of the heart could not be felt anywhere in the region of the left nipple nor could the heart sounds be heard there. On percussion an area of dulness was found bounded superiorly by a line running transversely from the lower end of the sternum to the eighth thoracic vertebra cutting the mammary and the mid axillary lines in the fourth and seventh left intercostal spaces respectively, inferiorly by the free costal margin in front and by the tenth left intercostal space in the mid axillary line.

On the right side there was dulness bounded above by the fourth right intercostal space, to the left by the left border of the sternum, below by the fifth right rib, to the right by a line about 7.5 centimetres (three inches) from the sternum. No heart beat could be felt, but the apical sound could be heard clearly with maximum intensity in the fourth right intercostal space just inside the nipple line. The heart sounds at all valve areas were normal in quality, intensity and rhythm.

Two days later the patient was examined by X rays. The diagnosis of transposition of the thoracic viscera was confirmed. By means of an opaque meal and enema the abdominal viscera were also seen to be transposed. The cardiac orifice of the stomach was situated to the right of the middle line and the pyloric to the left. The caecum was in the left iliac fossa and the ascending and descending colon to the left and right respectively.

The following day Dr. Walter Burfitt removed the appendix from the left iliac fossa, freed many adhesions causing a partial obstruction in the sigmoid flexure and confirmed the complete transposition.

Comment.

Complete transposition is not very rare, but the majority of cases are not diagnosed or are discovered *post mortem*. It is difficult to judge its frequency from the literature because undoubtedly there is some overlapping in the lists collected from time to time. At the Mayo Clinic[1] during 1910 to 1922 ten cases are reported among 347,000 patients.

In the complete form the health is not affected though some patients (as in the case reported here) are aware of the heart beating on the right side. On the other hand in the incomplete (and rarer) form the patient is weakly and much distressed by the slightest exertion.[2]

The pathology of the condition is still obscure and none of the theories put forward are satisfactory. The one most generally accepted is that of Hirschfelder[3] who maintains that in early embryonic life the position of the cardiac tube is changed, its direction being reversed from S to ?. This change is probably caused by the reversal of the direction of the blood stream which occurs if the usual relationship of the embryo to the primitive chorion is altered, so that its right instead of its left is placed nearer its blood supply. Adami[4] says that the transposition occurs only in the unpaired organs—stomach, spleen, heart *et cetera*—except in the case of the lungs which are changed over and there is also a functional exception, namely the speech centre. Usually the left third frontal convolution is more active than the right but in transposition this may be reversed.

H. H. Sherk[5] writes: "Its standing has changed from that of an anatomical curiosity to that of clinical interest and importance."

References.

(1) Quoted by H. H. Sherk.
(2) Mayers: *Proceedings of the Royal Society of Medicine*, 1921, Volume XIV., page 5.
(3) Hirschfelder: "Diseases of the Heart and Aorta," Third Edition, page 560.
(4) Adami: "Principles of Pathology," 1910.
(5) H. H. Sherk: *Surgery Gynæcology and Obstetrics*, July, 1922.

Reviews.

STUDY OF THE BLOOD.

The appearance of a third edition of Gulland and Goodall's textbook on the blood calls for a brief survey of the present position of the subject.[1] The advance of hæmatology may be said to have taken place in two definite directions, firstly towards a complete understanding of the composition and structure of the blood, the latter being preferably used in its strictest histological sense and secondly the detailed knowledge of the various disturbances of the hæmatopoietic system. As such the problems are intricately bound up with those of biochemistry, cytology and pathology primarily and touch on the border lines of half a dozen other sciences. The modern hæmatologist thus has a difficult task ahead of him when he sets out to compile a one volume textbook and must exercise considerable critical acumen in what he chooses or discards.

The authors of this well-known volume have in many ways succeeded, the publication of a third edition being good evidence that such has been widely recognized. At the same time there is much that is irritating and may

[1] "The Blood: A Guide to its Examination and to the Diagnosis and Treatment of its Diseases," by G. Lovell Gulland, C.M.G., M.A., B.Sc., M.D., F.R.C.P.E., and Alexander Goodall, M.D., F.R.C.P.E.; Third Edition; 1925. Edinburgh: W. Green & Son, Limited. Sydney: Angus & Robertson, Limited. Royal 8vo., pp. xvi. + 424.

well merit the careful consideration of the authors in future editions. Extreme cautiousness may be very well within certain limits, but when carried to such an excess that views opposed to those of the authors are practically dismissed with a few words and those of very little value, it is apt to be misinterpreted. Nowhere is this more noticeable than in the discussion of the origin of the blood cells, certainly a vexed enough problem at present. Surely the work of Sabin and her associates merits at least one reference.

The division into five parts is a happy one. The greater portion of the book is occupied with an excellent and detailed account of the diseases of the blood, bone marrow and lymphoid tissues, the blood in special diseases and diseases due to animal parasites. We have nothing but admiration for the immense amount of trouble the authors have gone to in preparing an accurate and readable survey. Here the student or busy practitioner will find all that he wishes in the way of useful information. The description of pernicious anæmia may well be singled out for its thoroughness. It is somewhat refreshing to meet with observers not wholly an echo of others who are perhaps a little more well known. This is especially the case in the controversial attitude taken to William Hunter's theory of oral infection in pernicious anæmia.

Another point worthy of much consideration is that the atrophic changes in the stomach in this condition are mainly of *post mortem* origin. One notes with surprise that there is no mention of Price-Jones's work on the size of the blood cells nor of fractional test meal findings. Under the description of the changes in the blood in diseases of the pancreas should be included an observation made by Mayo Robson many years ago that sometimes a pernicious anæmia picture is seen in chronic pancreatitis. The brief description of Ayerza's disease loses much of its value when no mention is made of the ætiological relationship of syphilis. A perusal of Warthin's papers would surely convince even the most critical of writers. The early chapters in the book are extremely patchy. Side by side with careful and detailed instructions for the counting of leucocytes, red corpuscles and platelets (although the agar method is not mentioned), are absolutely valueless descriptions of several of the important staining methods. One fails to see the reason for including such, when the account makes it necessary to consult a manual of pathological method for details as to concentration of dyes and composition of stains.

Extremely valuable are the descriptions of the blood in infancy and in certain animals. Laboratory workers must especially be grateful for the latter. The authors' views on the identity of lymphocytes and large mononuclear cells are not generally accepted. The discussion of the development of the blood cells is rather vague and not at all easy to follow.

The outlines of certain special methods of examination of the blood are, to say the least, inadequate and might well be omitted. We do not expect to find minute accounts of blood viscosity, specific gravity, hydrogen ion concentration, blood sugar and urea estimations in a volume such as this and are apt to become impatient and rather bored with a superficial outline. The obsolete method for estimation of blood calcium included is depressing. Such a criticism does not apply to the Van den Bergh test and we note with approval the reserve with which the somewhat exuberant statements of certain less critical writers are treated. The researches of Carrel on tissue culture are briefly touched upon and reference is made to their significance in hæmatology.

Despite the faults mentioned above and these could be easily remedied, we have no hesitation in recommending this volume to those in search of a complete and for the most part accurate guide to the study of the blood.

DIATHERMY AND GONOCOCCAL INFECTION.

"Treatment of Gonococcal Infection by Diathermy," a little book by E. P. Cumberbatch and C. A. Robinson, is as valuable in its sphere as the larger work by Cumberbatch is on the subject of diathermy in general.[1] Based on a large series of patients, treated from 1913 to 1924, the whole ground of gonococcal infection of the urethra, cervix, tubes and ovaries, prostate, seminal vesicles, epididymis, testes, *vas deferens*, bursæ and fibrous tissue has been covered. Clinical notes, details of treatment and results are given for over one hundred cases.

It is extremely difficult to find fault with a book when the author has balanced his material so evenly and exercised such sane judgement. The most salient feature of the book is the insistence on the necessity for treating the site of the original infection in practically all cases, a point neglect of which brings many failures. The necessity for a combination of other forms of physiotherapy with diathermy is also well emphasized. The galvanic and sinusoidal currents, massage and movements are necessary in many cases after the infection has been rendered harmless by diathermy.

The results are those obtained with methods and instruments evolved from the author's experience. The treatment of gonococcal urethritis by other means is dismissed in a few words of disparagement.

While we agree with his remarks in general and have not found the thermophore of Corbus and O'Connor satisfactory, we would point out that the disappearance of gonococci from a four days old discharge has been caused in twenty-four hours by the use of Sieman's and Halske's ingenious device. While the simpler methods are to be preferred when possible, we hold that this is the only device with which an equal temperature throughout the length of the urethra can be secured. The difficulty of using this instrument will stand in the way of its general adoption and this quite apart from its great expense.

It would be well for most diathermists to follow the advice of this little book and limit the application of this modality to the gonococcal infections mentioned by the author.

VASCULAR DISEASE.

In completing his delightful little essay on arterial disease under the title of arteriosclerosis within a month of his death, Clifford Allbutt was happily enabled to leave behind him a complete summary of the present state of our knowledge of a subject on which he was especially qualified to speak.[2] We might have added "and chiefly interested" had we not hesitated to be dogmatic as to what was the chief entertainment of a mind so cultured and versatile.

The ability to compress such a mass of facts and lucid reasoning into this little volume of ninety-six pages indicates a clarity of brain rarely found in one on the threshold of the ninetieth year, and incidentally illustrates the author's oft-repeated dictum that the duration of the functional capacity of a tissue is not to be measured in terms of years, but in that of blood supply.

Though he uses the word as a title, the author quickly reminds us that our knowledge is increasing so fast that arteriosclerosis has ceased to have a specific value in nomenclature and at best can survive only as a generic term for vascular diseases. In diagnosis we must now aim at a more precise definition. Already it is necessary to differentiate hyperpiesia, vascular changes resulting from chronic nephritis and arteriosclerosis. We may look forward in the near future to still further extensions of the classification.

Few of those who read this little book, will fail to widen considerably their vision of cardio-vascular disease and gain a clearer insight into the principles underlying its treatment.

[1] "Treatment of Gonococcal Infection by Diathermy: With an Appendix on the Treatment of Other Forms of Arthritis by Diathermy," by E. P. Cumberbatch, M.A., B.M., B.Ch. (Oxon.), M.R.C.P., and C. A. Robinson, M.B., B.Ch. (Cantab.), D.R.M.E. (Cantab.); 1925. London: William Heinemann (Medical Books), Limited. Crown 8vo., pp. vi. + 150. Price: 7s. 6d.

[2] "Arteriosclerosis: A Summary View," by the late Right Honourable Sir T. Clifford Allbutt, P.C., K.C.B., M.A., M.D.; 1925. London: Macmillan & Company, Limited. Crown 8vo., pp. 108. Price: 5s. net.

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The Public Health.

THE appeal to the individual to preserve his own health and to prolong his own life has always been a stronger argument than the prescription of rules or laws to protect the well being of the community as a whole. From the earliest time hygiene has been regarded rather as an irksome duty than as a sound principle. The ancient Jews incorporated many wise injunctions in their religious doctrines and endeavoured to find an ethical basis for the commands to recognize cleanliness of body in its widest sense as imperative. The apophthegm "cleanliness is next to godliness" is quoted in support of the fundamental idea that man owes a duty to his creator to safeguard his own and his neighbour's bodies by avoiding disease and all that appertains to disease. It will be remembered that the mosaic law determined that every person suffering from leprosy had to admit that he was unclean and had to isolate himself from his fellows. Since these earliest times there have been many proposals as to the proper method of attacking disease and preventing early death. The liberal interpretation of the term uncleanliness seems to have undergone some modification, for the importance of pure food, of a clean water supply, of the removal of excreta and other forms of dirt, of bathing and washing, of clean raiments and so forth has been permitted to overshadow the rational hygienic measure of seeking the sources of infection and removing or destroying them. Every now and again this obvious expedient reappears in a new garb in history. Perhaps the most curious suggestion that has ever been put forth in serious debate was the introduction into the House of Lords in the seventeenth century of a bill to sanction the burning of all ships that entered the Thames, together with all on board, when plague had broken out among the crew or passengers. It is scarcely necessary to add that the bill did not secure a majority, not even in the upper chamber. Although his words need not be taken very seriously or literally, Professor C. J. Martin was not unmindful of the same sound principle when he said during a discussion at the Pan-Pacific Congress in 1923, that it was perhaps a pity to have upset the old quarantine previously existing in the Pacific Islands of absorbing the newcomer into the general community after sterilization by cooking.

We are fast approaching the time when the care of the public health will be effected by rational methods. The departmental custom of evolving laws for the preservation of cleanliness and of following the provisions of these laws uncritically and by stereotyped procedures is dying out. There is ample evidence of this in the last annual report of Sir George Newman, the Chief Medical Officer of the British Ministry of Health. He devotes six long and instructive chapters to an analysis of the causes of death and disability and to the mass remedies which have been applied in a serious effort to remove these causes. Again and again he refers to the proposition that it is the general practitioner who first comes into contact with persons suffering from infective processes. It is the general practitioner who is in a position to recognize these diseases during their initial stages and to trace their origin.

In his general summary he points out that the five principal causes of death accounted in 1924 for 635 out of every thousand deaths. Bronchitis, pneumonia and other respiratory disease had a mortality of 174 per thousand deaths, diseases of the heart and circulation 168, cancer and malignant diseases 106, diseases of the nervous system 100 and tuberculosis 87. He has much to say concerning tuberculosis, other infective processes, cancer and diseases of infancy. But although he mentions diseases of the heart and circulatory apparatus as the second most prolific cause of death, he leaves this important chapter of the public health undiscussed. It is necessary to repeat in this place that deaths from diseases of the cardio-vascular system are even more numerous than those of the respiratory apparatus. This fact does not appear in statistics based on the Bertillon scheme. Is it

reasonable to include cerebral hæmorrhage under diseases of the nervous system? Are all forms of nephritis primarily renal conditions? Are not many of these affections dependent on lesions of the blood vessels? Surely there are many wrong classifications in the scheme. It has been shown on numerous occasions in these pages that diseases of the cardio-vascular apparatus contribute more largely than any other group to the causes of death. But it is possible to go a step further. The majority of the lesions of the circulatory system are themselves the results of infections. And if this be true, it follows that they can be prevented. It may be extremely difficult to attack these infections *en masse*. It seems from the statistical returns that it is very difficult to combat the infections of the respiratory organs, such as bronchitis and pneumonia. It is certainly a difficult task to prevent cancer. Yet nearly half of all deaths are due to these causes. The frequency of death from these causes is a sufficient reason for a concentrated and desperate effort to do something. Preventive medicine would be useless if it confined its attention to the easy tasks which are relatively insignificant, and left the difficult ones with an enormous toll of suffering and death untouched. We have one obvious point of attack. The rheumatic infections of the heart alone lead to almost countless forms of cardio-vascular lesions. In England and Wales with a population of 38,746,000 in 1924, over one hundred thousand deaths out of a total of four hundred and seventy-three thousand have been ascribed to this group. In Australia the population in 1924 was 5,873,500 and the total number of deaths numbered 54,980. Of these at least 10,000 must be attributed to diseases of the cardio-vascular system. Our six State departments of public health and the Commonwealth Ministry of Health are looking on at this appalling waste of energy and life. It is economically unsound, to say nothing of the cruelty of this inertia. Very little is known concerning the origin and development of these diseases. Is that not the strongest possible argument for the institution of an organized research into these unknown things, so that with increasing knowledge something may be done to stem this unbridled devastation?

Current Comment.

THE WHITE BLOOD CELLS.

At the beginning of his interesting and important study of the leucocytes in health and disease published in this journal in June, 1923, K. Douglas Fairley pointed out that it is impossible to diagnose abnormal conditions of the blood until the physiological variations in the normal individual have been determined. Fairley concluded that it is the range of the normal leucocyte count and not the average count which is important. He held that the physiological variation of the total leucocyte count in normal adults is probably between 4,500 and 15,000 per cubic millimetre. At the same time he referred to the wide variations which may occur in the white cell count in the same person at different times.

In an exceedingly interesting, if somewhat long communication Dr. F. R. Sabin, Dr. R. S. Cunningham, Dr. C. A. Doan and Dr. J. A. Kindwall have discussed the variations of the white cells in the normal individual.[1] They cite the findings of many workers on this subject and on the variations met with in disease and after experimental procedures. They suggest that all the observations have been made with an insufficient basic knowledge of the normal variations which occur in the daily rhythms of the blood cells. Their observations have been made with the aid of the supravital technique previously described by Dr. Sabin.[2] According to this technique a warm box or a warm stage incubator is used for the microscope. Dr. Sabin lays great stress on the necessity for cleanliness of slide and cover glass and on the method of preparing the film. It is not necessary to describe these in any detail. She claims that with the use of the supravital method it is possible to distinguish cells which have been stimulated to activity from those which are degenerating. She also holds that it is possible by this means to distinguish the old and dying cells and so to complete the life cycle of the several types of white cell.

In their study of the rhythm of the white cells Dr. Sabin and her coworkers report the results of six experiments. They made complete blood counts every fifteen minutes from each of six persons for seven to eight hours. They were unable with the number of workers at their disposal to shorten the interval between each examination. Had this been possible they claim that much might have been gained. In five instances the number of white cells included in the differential count was one hundred, in the sixth the number was two hundred. They found that there was approximately an hourly rhythm in the number of white cells. Variations of three or even four thousand cells per cubic millimetre occurred at intervals of an hour. Without exception the counts were higher in the afternoon. Dr. Sabin and her fellow workers point out that observations on a series of six individuals do not justify definite conclusions. Taken in conjunction

[1] *Bulletin of the Johns Hopkins Hospital*, July, 1925.
[2] *Ibidem*, September, 1923.

with observations on rabbits which yield the same findings, however, they point to the fact that the entire normal range of variation in the number of white cells is covered rhythmically each day. The highest level is about twice the lowest, the fluctuations are rhythmical with a definite tendency to increase each hour. The higher level in the afternoon is sometimes attained through greater fluctuation and sometimes by a higher mean level. Many workers have discussed the question of digestion leucocytosis and the authors point out that if digestion leucocytoses are to be tested on individuals who are ill, it will be necessary to have some data as to whether the normal rhythm is itself altered in the disease from which they are suffering.

While making repeated films of blood from the same individual by the supravital method the authors noted that "non-motile" leucocytes occurred quite irregularly. At times the films contained none and occasionally their proportion was high. It is generally accepted that in the adult organism which is neither gaining nor losing weight, the rate of cell division is correlated with the rate of cell death. In these circumstances it appeared to the authors that if they could arrive at an estimate of the amount of cell death of the leucocytes in the blood stream, they might be the better able to analyse the rhythm of the leucocytes. This analysis is a complex problem and several important factors have to be considered in connexion with it. The first of these is concerned with the delivery of mature cells into the circulation. Other factors concerned include the question of the passing of the cells out of the circulation as well as the possible variation of the proportion of the different types of cell to be found in the visceral as compared with the peripheral circulation. The non-motile leucocytes are in the opinion of the authors the dying neutrophile cells. In fact Dr. Sabin and her collaborators state that they "are entirely sure" of this. They have repeatedly seen all the transitions between the motile and the non-motile forms and they often found a few leucocytes which still reacted to the stain, but had become rounded and stopped moving. On examination of the graphs dealing with the non-motile cells it is seen that the peaks on the curves representing these cells tend to be opposite a depression in the curve of the motile cells. Further it is generally true that in all the curves there is depicted a rise in the motile leucocytes following the showers of the non-motile cells after a period of fifteen to thirty minutes. The amount of the rise is not proportional to the showers of the non-motile cells, but it is strikingly constant. The converse is not always true. Dr. Sabin and her collaborators are loath to draw the conclusion that the rise in the curve of motile forms represents a replacement of the dead cells at so short an interval as fifteen minutes. Another rise in motile forms was frequently seen about two hours after a shower of non-motile cells. They have no evidence which will allow them to determine which of the two subsequent rises is to be correlated with a given shower of non-motile cells. If the first is held to be responsible, it is thought that the rise may be correlated with a vasomotor phenomenon in which the leucocytes are already within the circulation, for example in the sinuses of the bone marrow. Barcroft has shown that the spleen may be an extramedullary source of these cells and the authors are inclined to include the capillaries of the viscera in connexion with this manifestation. They sought to analyse the constant afternoon rise of leucocytes, but were unable to show that the number of dying cells during the morning hour is sufficiently greater than in the afternoon to account for the afternoon rise. In their opinion this does not invalidate the suggestion that the dying cells are concerned in the maintenance of the normal level of the white cells. They express the opinion that among many other factors the changes in the acid base equilibrium of the plasma must ultimately be considered in this analysis. The total percentage of non-motile cells for the entire day is not high, but when it is considered that a given shower of non-motile cells may total 25% to 36% of the white cells, it is clear that such a periodical death rate of cells constitutes a factor requiring consideration in the estimation of blood counts. The authors also include observations which they regard as demonstrating that the showers of non-motile cells are of general occurrence and are in no way limited to the peripheral blood.

Dr. Sabin and her collaborators found that the lymphocytes have a half-hourly rather than an hourly rhythm. They conclude that the large lymphocytes are the younger types, but that the large, intermediate and the small forms all functionate, except a very small percentage of those of the small type which have become senile. Those intermediate in size are most frequently seen in active motion. They found a constant shifting of the small and intermediate forms and a constant reciprocal relationship between them. They were unable to demonstrate showers of dying lymphocytes, but express the opinion that these cells become progressively basophilic as they mature. They are at a loss to explain the mechanism by which the total number of lymphocytes is kept so constant while there are such pronounced fluctuations between the small and the intermediate forms. They evidently intend to investigate this question on some future occasion.

In regard to the other cells the authors are convinced that the double terminology of large mononuclear and transitional cells should be dropped and the term monocyte used. In each series of counts some evidence of division of the monocytes was found and in every instance small monocytes, regarded as the daughter cells, were seen. It is held to be possible that both basophile and eosinophile cells have a non-motile phase, but as these cells are so few in number, they are difficult to analyse. In the circulation of five out of six apparently normal individuals small percentages of myelocytes were found. Dr. Sabin and her fellow workers point out that their findings open up wide avenues for further research and their studies will be awaited with interest.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Pathology of Yellow Fever.

W. H. HOFFMANN (*Klinische Wochenschrift*, April 2, 1925) states that as a result of his work at Havana he has noted a definite destruction of red cells in the spleen, liver and lymphatic glands which is probably the cause of the hæmolytic jaundice observed in the disease. He also noted Zenker's degeneration of the voluntary and cardiac muscles, swelling of the follicles and Peyer's patches of the small intestine and acute parenchymatous degeneration of the kidney with numerous tube casts. All these changes have been produced in the guinea pig infected with the *Leptospira icteroides* and are characteristic of all leptospiral infections. The presence of tube casts seems to be peculiar to yellow fever and is an important point in differential diagnosis. In all probability yellow fever is caused by the *Leptospira icteroides* and this knowledge will greatly assist in its eradication.

Von Recklinghausen's Disease of Bone.

E. H. EISING (*The Journal of Bone and Joint Surgery*, July, 1925) reports a case of generalized *osteitis fibrosa cystica*. In 1891 von Recklinghausen made his first report, describing three cases of generalized bone involvement and applied to the condition the name *osteitis fibrosa cystica*. The term von Recklinghausen's disease is often applied to localized cystic conditions in bones which show one or more areas of decalcification with fibrous replacement, but the author thinks it should be reserved in accordance with von Recklinghausen's own description to those cases in which the disease is diffuse and slowly progressive.

Congenital Defects of the Long Bones of the Lower Limb.

ROBERT OLLERENSHAW (*The Journal of Bone and Joint Surgery*, July, 1925) records eleven cases of congenital defects of the long bones, two of deficient femur, two of congenital absence of the fibula, three of absence of the tibia and one of "congenital amputation" through the leg. It is taught that defects in the extremities may be due to failure in the inherent power of growth of the germinal matter which forms these parts, or to mechanical interference from without. The author's investigations have led him to the conclusion that mechanical interference has nothing at all to do with deficiencies in the long limb bones. The predominant cause is undoubtedly a cessation of growth in one or other set of embryonic cells at a period between the fourth and sixth weeks of fœtal life. The cause of the arrest of growth is quite unknown. It has long been the custom to ascribe limb defects to amniotic bands, constrictions caused by the umbilical cord and the like. The author has seen two cases in which such so called "cord constriction" was present on leg and foot and yet both hands and both feet showed defects or excesses of metacarpals and phalanges, multiple lesions which could not possibly be ascribed to cord or amniotic bands. It seems more than likely that the so called constrictions are not constrictions at all, but merely one of the results of the interrupted limb growth. Again when the deformity occurs as a symmetrical condition on the two sides or in twins, it must be presumed that a failure in growth of limb material has occurred. Further, the more severe conditions known as *amelus* in which the defective limb is simply represented by a bud, *peromelus*, containing four defective extremities, and *phocomelus*, characterized by well formed hands and feet attached to the trunk without any intervening limb, all long bones being absent, are obviously not due to mechanical cause but to cessation of growth in the limb buds.

Stenosis of Aorta due to Kypho-Scoliosis.

G. KLAWANSKY (*Klinische Wochenschrift*, April 23, 1925) reports a case of mechanical stenosis of the aorta with hypertrophy of the left ventricle due to the presence of a kyphoscoliosis. The patient was admitted with severe respiratory symptoms. The cardiac dulness extended between both mammary lines, but there were no *bruits*. The liver was enlarged and reached the pelvic brim. *Post mortem* examination revealed definite cardiac hypertrophy especially of the left ventricle and a patent *foramen ovale*. The first part of the aorta was dilated and was followed by a stricture due to spinal curvature in the third dorsal area. The aortic valves were not affected. The kidneys were normal.

Arthrogryposis Multiplex Congenita.

P. LEWIN (*The Journal of Bone and Joint Surgery*, July, 1925) records two cases of *arthrogryposis multiplex congenita*. The name was coined by Stern and is derived from two words meaning "curved joint." The only article the author was able to find in the literature was that of W. G. Stern in which he describes four cases. The ætiology is unknown. In the author's cases there is apparently no hereditary factor. It is possible that the theory of Mürk Jansen of the causation of achondroplasia might explain this condition, namely, a small amnion with increasing hydrostatic pressure. Stern believes that the condition is the result of a rare combination of intrauterine periarthritis and intrauterine pressure. The lesions are confined to the articular and periarticular structures. There is deformity with limitation of movement. The deformity consists of clubbed hands and feet with limitation of motion of all joints. Mentality is much below normal.

Neuroblastoma of the Suprarenal Capsule.

R. A. FLEMING and J. DAVIDSON (*Edinburgh Medical Journal*, July, 1925) record complete notes with illustrations of a case of neuroblastoma (neurocytoma) of the left suprarenal capsule in a boy, four years of age. *Post mortem* it was found that the skull was definitely enlarged and there was advanced proptosis of both eyeballs. The whole of the subcutaneous tissue of the scalp was replaced by a red fleshy mass of tumour growth. It was dark red in colour and had the appearance and consistency of muscle. The surface of the bone was much eroded and was soft in consistency. The growth penetrated the bone so that most of the extradural space was occupied by a mass of malignant growth which had not become subdural in any part. There was nothing of note in the brain. The left suprarenal capsule was replaced by a large homogeneous, dark red, comparatively soft mass, six by five and a half centimetres in size. The mass was completely encapsulated. In addition to the bones of the skull and *dura mater* metastases were found in the liver, pancreas and long bones, but not in the lymphatic glands or lungs.

Congenital Proximal Radio-Ulnar Synostosis.

D. M. GREIG (*Edinburgh Medical Journal*, July, 1925) describes two typical specimens of congenital proximal radio-ulnar synostosis, one fully a century old from the collection of Sir Charles Bell. The deformity may be unilateral or bilateral. Like other congenital defects it is apt to be associated with other abnormalities. It has been found associated with smallness of the wrists, subluxation of the shoulders, malformation of the forearm and hand, abnormality of the knee joints, congenital dislocation of the hips, club-foot and hernia. A more serious accompaniment than any of these is mental deficiency and this was present in four out of the eighty-four cases collected by the author. This high rate of cerebral affection indicates more than a mere fortuitous circumstance. Indeed the occurrence of mental deficiency may be even more frequent, for in some cases the very early age of the patient makes mental efficiency most difficult to estimate, nor must it be forgotten in how many abnormalities of the extremities there coexists a cranial or cerebral circumstance. Heredity was manifested on six occasions. A list of seventy-two references is appended.

Acromegaly.

F. HERTZOG (*Klinische Wochenschrift*, August 6, 1925) describes a symptom of acromegaly which is frequently omitted from textbooks. He noted an abnormal degree of hyperextension of the fingers and to a lesser

extent of the toes. It was not due to hypotonus of the muscles, but to an enlargement and atony of the joint capsules.

MORPHOLOGY.

The Relation of "Rouget" Cells to Capillary Contractility.

ELIOT R. CLARK AND ELEANOR LINTON CLARK make a contribution to the question as to whether the "Rouget" cells observed on capillaries function as primitive muscle cells as maintained by Vimtrug and Krogh (*American Journal of Anatomy*, May 15, 1925). Their observations are based upon studies of the wells of the blood capillaries in the tadpole's tail. Two types of capillary contraction were noted; first an active type which may occur spontaneously or may be produced experimentally by strong chloretone or by lowering the temperature and secondly a passive type which may be caused by temporary disturbance of the circulation. The second stage appears to be dependent upon the elasticity of the endothelium which has a tendency to narrow down when the inside pressure is lowered.

The active type of contraction is characterized by a wavy contour of the vessel wall in all young capillaries and in the smaller vessels of older larvæ. In the contraction of the larger arterial and venous capillaries of older stages and in the passive narrowing at all stages the vessel outline remains smooth and there is a simple decrease in the vessel calibre. Both types of contraction may occur without regard to the presence or absence of any adventitial cell on the vessel wall or to the particular location of such cells. Contractions are observed in vessels before any "Rouget" cells have developed on their walls and after the formation of such cells contractions frequently are initiated at a distance from them. At the moment of an active capillary contraction or of a passive narrowing of the vessel the capillary apparently draws away from the "Rouget" cells present on its wall, leaving a perceptible space between the vessel and a "Rouget" cell viewed in profile. The capillary endothelium of amphibian larvæ has a definite tonicity and a power of contractility which is entirely independent of the presence of any form of adventitial cell.

Nerve Supply of Small Intestine.

S. E. JOHNSON (*Journal of Comparative Neurology*, April, 1925) records a series of observations on the anatomical arrangement of the nerves in the plexuses of the small intestine. The silver pyridine method of staining was used in conjunction with section of the afferent and efferent nerves of the cœliac ganglion. Only one type of nerve cell was found in the myenteric plexus. No evidence of true nerve nets and no synopses between local elements were discovered. The extrinsic and intrinsic elements in the plexus were associated by the usual type of sympathetic intercellular plexus. The extrinsic fibres which enter the gut wall and form a part of the plexus, are of vagal origin. The vagal neurone is thus a preganglionic link and the cells of the plexus give the postganglionic link. The cell bodies of the postganglionic neurones associated with the sphlanchnic nerves are situated in the cœliac or other extraintestinal sympathetic ganglion. The author discusses the physiological significance of the facts and their adequacy to explain the various intestinal reflexes.

Dentition and Palate of the Australian Aboriginal.

IN a recent publication of the University of Adelaide under the Keith Sheridan Foundation, T. D. Campbell has given us a survey of the dentition and palate of the Australian aboriginal (Publication No. I., 1925; Hassell Press, Adelaide). The work covered a wide range; the numbers of skulls and teeth examined were six hundred and thirty and ten thousand five hundred respectively. In his summary the author concludes that the jaws and teeth of the Australian aboriginal are strikingly well formed with a capacious palate, well shaped arches and large teeth; all of which depict a thoroughly functioning and efficient masticatory system. The teeth of the Australian aboriginal are larger in size than those of any other living race and in comparison with those of extinct races are sometimes larger and in most dimensions equal in size. The teeth in crown form cusp number and root form are exceptionally primitive, probably more so than any other living race and also than in some extinct races, such as Tasmanian and Neanderthal man. The arches are well formed and the type contours show in the palate that parallel figure which is considered the most primitive outline. The palate is highly arched and capacious and so far as available comparative results show, is probably larger than that of any living race, larger than the recently extinct Tasmanian and the bronze age dweller of Great Britain, but in its type form not so large as some of the Pleistocene men, such as those of Heidelberg and Piltdown. It does not possess the somewhat circular form attributed to earlier man, but presents the more primitive contour. The symmetrical, occlusal and proximal wear of the teeth and the glenoid fossæ depths indicate that the Australian probably effected mastication by regularly alternating lateral excursions of the mandible. The vitality of the pulp and periodontal membrane was apparently very vigorous as has been shown in the case of the pulp by the remarkabe manner in which it physiologically resisted encroachment on its cavity by secondary deposit and in the case of the membrane by the functional stresses it withstood without showing evidence of frequent or general periodontal affections. The children were remarkedly free from dental diseases and eruption of the teeth and formation of the arches and development of the palate took place in a very regular manner. The dentition was strikingly free from developmental aberrations and dental diseases. The latter were almost entirely limited to old age. The immunity from dental diseases would seem to be very closely related with the coarse tough food which formed their diet, and the crude methods of preparation and cooking, when such were utilized. Probably the chief benefit derived from such a study as has been here attempted is the great lesson to be learned, namely that if modern civilized races are to preserve and strengthen the contour in the lower architecture of the face, to make the masticatory organs a physiologically functioning unit, to diminish the awful present day ravages of dental diseases and their concomitant systematic disturbances and through all this to assist in building up sounder and healthier conditions, then there will have to be some drastic changes in the present day dietary and method of food preparation—in short a return to food conditions much more primitive than those at present in vogue will be necessary.

The Pancreatic Bladder,

E. A. BOYDEN (*American Journal of Anatomy*, September, 1925) reports a number of cases of pancreatic bladders in the cat. The anomaly is comparatively rare and previously it was difficult to exclude the possibility of the bladder having been developed from the hepatic diverticulum. Boyden's work reveals that the walls of the pancreatic bladder are essentially different to those of the gall bladder, being essentially similar to an hypertrophied pancreatic duct. By inflammatory change it is possible for it to form a fistulous connexion with the biliary tract and so to lead to confusion. Divided gall bladders are of frequent occurrence, but there is no reason to suppose that the pancreatic bladder is derived in that manner.

Effect of Vasectomy on Swine.

B. L. WARWICK (*Anatomical Record*, September 25, 1925) discusses the fact that vasectomy *per se* does not cause degeneration of the seminiferous tissues. Steinach in 1920 maintained that vasectomy or ligation of the *vas deferens* always leads to degeneration of the germinal epithelium and hyperplasia of the interstitial cells. The increase in the number of interstitial cells has been supposed to produce more testicular hormone and to stimulate rejuvenation. Moore and Oslund in 1923 and 1924 showed, however, that vasectomy of itself does not cause degeneration of the seminiferous tissue and that when degeneration does take place it is due to other causes, usually to artificial cryptorchidism. Moore and Quick in 1924 explained the changes following artificial cryptorchidism as due to differences in temperature.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on August 27, 1925, DR. R. B. WADE, the President, in the chair.

Arthritis, Fibrositis and Allied Conditions.

DR. C. BICKERTON BLACKBURN, O.B.E., read a paper entitled: "The Ætiological Factor as a Guide to Treatment in Arthritis, Fibrositis and Allied Conditions" (see page 619).

Diathermy in the Treatment of Sciatica, Fibrositis and Arthritis.

DR. J. W. HOETS read a paper entitled: "The Place of Diathermia in the Treatment of Certain Chronic Conditions, such as Sciatica, Fibrositis and Arthritis" (see page 623).

DR. O. A. A. DIETHELM congratulated Dr. Blackburn and Dr. Hoets on their papers. Dr. Blackburn had treated his side of the question so ably that there was little left to discuss. In regard to the treatment of chronic arthritis he asked Dr. Blackburn what value he placed on the estimation of the uric acid in the blood. He thought that chronic arthritis, no matter the form assumed, might be divided into two groups according to the ætiology. In the first group might be placed those cases which were occasioned by the presence of an infective focus or caused an infective disease. The second group would comprise those brought about by some error in metabolism and especially uric acid disturbance. Blood estimations might help a lot, for if a focus of infection was not found, an abnormality in the uric acid content, if discovered, might be treated accordingly with good results. He agreed with Dr. Blackburn in regard to his attitude to the responsibility cast upon the endocrine system and its relation to rheumatoid arthritis. He thought that when good resulted in such cases from the administration of thyreoid extract, the patient was generally in the subthyreoid state and had some thyreoid inadequacy; on the other hand numbers of patients did not manifest nor ever had manifested the slightest inadequacy—particularly those with rheumatoid arthritis. He agreed that sour milk treatment was useful in some cases, if there was any gastrointestinal disturbance. He asked Dr. Blackburn what his custom was in regard to the use of "Atophan." This drug was undoubtedly of use if the blood uric acid content was high and over 3.5 milligrammes per hundred or if a gouty tendency was present. Ought "Atophan" to be given continuously or did Dr. Blackburn accept Chace's views that it should be given for two, three or four days with an alkali and then withheld for a period of one week or more and subsequently given again and so on. Chace and Myers had found that "Atophan" definitely lowered the curve of uric acid in the blood, but that if its use was continued for more than three to five days continuously the curve rose higher. He had also found that it produced better results if bicarbonate of soda were given as well. The Americans used salicylate of soda a great deal in addition to "Atophan" and found that its effect on uric acid was similar to that of "Atophan." Two other drugs undoubtedly of prime importance in the treatment of fibrositis, especially when a gouty tendency was present, were potassium iodide and guaiacum and with these the results were often good. In regard to Dr. Hoets's paper he referred to the work of Professor Freund which he had been privileged to see in Vienna. In that city the results obtained with diathermy in cases of neuritis and especially chronic cases of sciatica were excellent, but massage was usually combined with the diathermy treatment. The results in cases of arthritis in that clinic were, at that time, rather disappointing.

DR. N. D. ROYLE referred to the question of organisms in arthritis and said that two years previously Ely in California had described amœbæ in connexion with joints which were the seat of arthritic changes. The communication had appeared in the *Journal of Bone and Joint Surgery* and in the *Clinics of North America*. He was glad that Dr. Hoets had included in his paper the statistics from the Lewisham Hospital. They coincided with his own results in private practice. It was surprising, however, to notice in recent papers in THE MEDICAL JOURNAL OF AUSTRALIA that results of a satisfactory nature had not been obtained in the treatment of arthritis. He had had success with arthritis, but only after long periods of treatment. With diathermy the fibrous tissue was vascularized and softened and was capable of elongation and more movement was possible. He did not advise massage with diathermy in the treatment of sciatica. He thought it was unnecessary.

DR. W. J. STEWART MCKAY said that he was disappointed that no mention had been made of infection from the gums in connexion with arthritis. He had studied the question two years previously and had come to the conclusion that no man should perform an operation until he had examined the patient's teeth. He had seen one or two fatal results from septic pneumonia. W. J. Mayo had told him in conversation that he felt that many of the bad results commonly ascribed to ether were in reality due to infection from some focus. He had had a case of fatal pneumonia in his own practice and had found subsequently that he had failed to examine the teeth which were septic. He did not think that there was any doubt as to the relationship between septic foci and the conditions under discussion. He related the history of a patient at Lewisham Hospital. The patient had had several teeth extracted from the upper jaw. The patient's knee, however, had been affected, it had been swollen and painful. An X ray examination of the lower jaw had been undertaken and apical abscesses had been found in connexion with two teeth. When the teeth were removed the patient's temperature had fallen from 38.9° C. (102° F.) and she had experienced no more pain, but the damage to the joint had already been done. He could relate twelve cases which had occurred within a space of two years in which the joints had been affected in this manner. Although they might be accustomed to laugh at it, Hunter had said thirty years previously and time had proved it, that teeth were one of the most potent causes of joint infection. There must be thousands of persons with infected teeth who did not suspect it and in these persons local treatment of the joint was futile.

DR. F. J. GWYNNE congratulated both the speakers. He asked Dr. Hoets several questions in regard to technique. He asked whether in cases characterized by a slow response to this treatment Dr. Hoets continued with the electrodes in standard positions or whether he altered the position and size of the electrodes in an attempt to bring the affected area within the course of the high frequency current. It had been shown by experiment in America that on account of the varying resistances of the tissues it was possible to miss the area which it was desired to influence by this treatment. It was found that in stating the dose it was necessary to mention another factor as well as the ampèrage. It appeared that there was an optimum frequency for satisfactorily heating the tissues through and through. It was stated to be 700,000 per second; with higher frequencies the current tended to encircle the part instead of passing directly from electrode to electrode.

DR. P. FIASCHI, O.B.E., wished to remind those present of the importance that syphilis played as a causative factor of sciatica. Professor Fournier placed the neuralgias of the sciatic nerve second in frequency to those of the head. He had seen some cases of sciatica treated by various methods without success in which happy results had followed the use of antisyphilitic treatment. He had made a life long enemy of one individual who, when cured, discovered the means by which the result was obtained. He asked Dr. Hoets whether, in his thirteen cases, the question of a syphilis had been investigated.

As regards the treatment of gonorrhœal joints he had found that the intramuscular injection of some of the

"606" derivatives advocated by Levy Bring, of Paris, such as "Sulfarsenal" or the later one "Eparseno," had given results superior to any of the vaccines or sera.

The old method of strapping the pelvis posteriorly with zinc oxide adhesive plaster, as carried out at the Hospital for the Ruptured and Crippled in New York for many years, gave a considerable amount of immediate relief to cases of sciatica.

Dr. G. A. Brookes supported Dr. Fiaschi and emphasized the necessity for careful investigation in regard to the presence of syphilitic infection.

Dr. D. J. Glissan said that he was particularly interested in Dr. Blackburn's paper because a surgeon was apt to lose sight of the medical aspect of the conditions in question. It was difficult to meet on a common basis on account of the different nomenclature. Using the generic term he would accept with caution the advice to encourage movement especially in the septic type of joint. He had found that the most potent curative factor was rest. A joint should not be moved if it was tender; a tender joint was an inflamed joint and inflamed joints needed rest. Many so-called cases of sciatica were due to pain referred along the sciatic nerve to portions of its peripheral distribution and were due to inflammatory conditions in the hip, lumbar, spinal or sacro-iliac joints. He also asked Dr. Blackburn from which part of the tooth he prepared his vaccines in cases of periapical sepsis. He pointed out the necessity of avoiding the oral surface of the tooth and obtaining a culture from the apex only.

Dr. Lennox Teece asked Dr. Blackburn whether he would remind his medical colleagues of the paramount necessity of splinting the joints of patients suffering from arthritis. What avail was it if the arthritis was cured, but the patient was left with a deformity?

Dr. R. B. Wade said that they were indebted to Dr. Blackburn for his careful critical survey of the subject and to Dr. Hoets for his moderation in presenting a new method of treatment which would give a certain measure of relief. He referred to the type of patient who got relief from the cutting off of carbohydrates on account of a disorder of the carbohydrate metabolism.

Dr. Blackburn in reply thanked the members for the way in which they had received his paper.

In reply to Dr. Diethelm he agreed that with the help of biochemists more would be accomplished. There was no subject in which research was needed more. He was not prepared to say how far uric acid entered into the picture. He had been careful in his paper to talk about "some disturbance of synthesis of nitrogenous waste products." Endocrine therapy was quite a different question. Some years previously he had seen an article on success attained by the use of thymus gland extract. He had been keen on trying it, but had had uniform failures except in one instance. The patient had been a woman at the menopause and she had suffered from periarthritis of almost all her joints. He had ordered her thymus extract in doses of 0.3 gramme (five grains) three times a day. He had told her to return in a month. The patient had returned in a fortnight and had said that her joint condition was better, but that she could not continue with the treatment. She had been tremulous, had lost weight and had had staring eyes. The chemist presumably had never heard of thymus gland and had given thyreoid.

In regard to "Atophan" he had made it clear in his paper that he gave the drug intermittently. He gave guaiacum with diffidence, for there was no reason for giving it except that some learned men in the past had said that it was of service. He thought that improvement following its use might really be due to the effluxion of time.

In reply to Dr. Stewart McKay he said that focal sepsis had been placed first in ætiology in his paper. He thought that all sepsis in the mouth should be eradicated at once, but at the same time there was a tendency to go too far in the drawing of teeth. He recalled the case of one man with sciatica who had been on splints for two and a half months. Dr. Blackburn had suggested that a crowned tooth should be examined by X rays. Five apical abscesses had been discovered and after their removal improvement had been immediate.

In reply to Dr. Glissan he said that he would certainly not take a culture from a whole tooth. He invariably had a culture made from the apex of a tooth as soon as it was extracted. In regard to the question of movement he agreed that rest was essential during an acute exacerbation. He agreed with Dr. Teece in regard the splinting, at the same time he pointed out that many patients were not treated in the hospital where they could be watched and prevented from getting deformities. For this reason he did not encourage patients who were at home, to rest if they could move about at all.

In conclusion Dr. Blackburn congratulated Dr. Hoets on his admirable paper and on the moderation which he had displayed. Dr. Hoets had mentioned both failures and successes. Dr. Blackburn also referred to the value of ironing the back in the treatment of fibrositis.

Dr. Hoets in reply thanked those present for the way in which they had received his communication.

In reply to Dr. Gwynne he said that it was often necessary to juggle with the size of the electrode, with the point of its application and with the size of the current. Occasionally with a high reading an increase of pain resulted and a lower reading was better.

In reply to Dr. Fiaschi he said that all the patients had been referred from other departments. When necessary Wassermann tests were carried out. One patient had slipped past and had subsequently yielded a response to the Wassermann test. He had been suffering from *tabes dorsalis* and had been sent back as unsuitable for treatment by diathermy. In regard to Dr. Diethelm's statement that the results from diathermy in the treatment of arthritis in Vienna had been disappointing, he could not help thinking that the treatment had not been continued for a sufficiently long period. Improvement always took place slowly, but steadily.

ARMISTICE DAY CEREMONY.

On November 11, 1925, Dr. Stanley Argyle, the President of the Victorian Branch of the British Medical Association, performed a simple but impressive ceremony in placing a wreath of remembrance upon the War Memorial in the foyer of the Medical Society Hall.

At the meeting of the Council held on November 12, 1925, it was resolved on the motion of the President, to institute an annual Armistice Day ceremony of tribute to the members of the Branch who sacrificed their lives in the Great War. It is intended that invitations shall be issued each year to the relatives of the gallant dead and to all members of the Branch.

NOMINATIONS AND ELECTIONS.

The undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Flynn, John Joseph Witton, M.B., Ch.M., 1924 (Univ. Sydney), Martin Road, Centennial Park.
Geoffroy, Alfred John, M.B., Ch.M., 1924 (Univ. Sydney), c.o. Messrs. Richard Thompson and Company, 15, Castlereagh Street, Sydney.
Hardwicke, George Augustus, M.B., Ch.M., 1925 (Univ. Sydney), Walton Crescent, Abbotsford.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Allen, F. T., M.B., Ch.M., 1925 (Univ. Sydney), 96, Cardigan Street, Stanmore.
Clough, George Miller, M.B., B.S., 1924 (Univ. Sydney), Springwood.
Davy, Ashleigh Osborne, M.B., Ch.M., 1922 (Univ. Sydney), c.o. Royal Sydney Golf Club, Rose Bay.
Flynn, Michael Richard, M.B., 1919; M.S., 1920 (Univ. Sydney), Martin Road, Centennial Park.

Graham, Alexander William, M.B., Ch.M., 1924 (Univ. Sydney), Merriwa.
Gray, Alexander William Wheatley, M.B., Ch.M., 1924 (Univ. Sydney), Coast Hospital, Little Bay.
Ralston, John Windeyer, M.B., Ch.M., 1924 (Univ. Sydney), Bonalbo.
Standish, William Alexander, M.B., Ch.M., 1924 (Univ. Sydney), 206, Victoria Street, Darlinghurst.
Arnott, H. R., M.B., Ch.M., 1925 (Univ. Sydney), c.o. Commercial Banking Company of Sydney, Limited, 18, Birchin Lane, London, E.C.3.
Edwards, J. H. D., M.B., Ch.M., 1925 (Univ. Sydney), "The Manse," Ian Street, Rose Bay.
Lane, Muriel S., M.B., Ch.M., 1921 (Univ. Sydney), 20, Kitchener Parade, Newcastle.
Lansdown, M. V., M.B., Ch.M., 1925 (Univ. Sydney), 21, Turner Avenue, Haberfield.
Holcombe, T. W. Y., M.B., 1925 (Univ. Sydney), Hunter's Hill.

Medical Societies.

CENTRAL SOUTHERN MEDICAL ASSOCIATION.

A MEETING OF THE CENTRAL SOUTHERN MEDICAL ASSOCIATION (affiliated with the New South Wales Branch of the British Medical Association) was held at the Hotel Canberra, Canberra, on September 11, 1925, DR. P. BLACKALL and later DR. H. R. COPE, the President, in the chair. This meeting is the first meeting of a medical society held in Federal Territory and its historical significance was fully appreciated. There was a good attendance of members from Queanbeyan, Goulburn, Canberra, Yass, Burrow, Cooma and Gunning. In addition Dr. W. H. Crago, the Honorary Treasurer of the New South Wales Branch of the British Medical Association, and Dr. J. Adam Dick, C.M.G., delegate of the New South Wales Branch of the Association on the Federal Committee, Dr. A. L. Dawson and Dr. H. G. Leahy were present.

In opening the proceedings Dr.Blackall welcomed the guests and expressed the appreciation of the Central Southern Medical Association of the interest shown by the Council of the New South Wales Branch of the British Medical Association in their affairs. They had evidence of this interest in the presence of two members of the Council of the Branch at the meeting.

Instructions to Delegates.

Several notices of motion to be presented at the annual meeting of delegates of the local medical associations with the Council of the New South Wales Branch of the British Medical Association on October 2, 1925, were discussed and the delegate, Dr. J. English, received the instructions of the members present at the meeting.

Local Meetings.

On the motion of DR. P. BLACKALL, seconded by DR. J. ENGLISH, it was resolved:

> That it is the wish of the local associations that the Council, if possible, arrange on request for a leading member of the profession to attend their general meetings for the purpose of reading papers or delivering addresses and that the speaker's subject be notified to the local associations before the meetings.

Friendly Society Lodge Practice.

DR. H. R. COPE said that the committee would be glad to receive definite information concerning the proposed friendly society lodge appointments at Queanbeyan and Canberra.

DR. P. BLACKALL, DR. G. N. DODSON and DR. C. M. EDWARDS supplied the information. It was anticipated that the question at issue would be settled expeditiously.

The Financial Development of the New South Wales Branch.

DR. W. H. CRAGO, the Honorary Treasurer of the New South Wales Branch of the British Medical Association, gave a very interesting account of the financial position of the New South Wales Branch of the British Medical Association and its development since the recognition of the Branch in 1880. Dr. Crago mentioned that he had been an executive officer of the Branch for a period of thirty-seven years. This was a record for long service of executive officers of all the Branches and Divisions of the British Medical Association. He gave the members some insight into the remarkable and self-sacrificing manner in which he had worked through all that period in his very responsible office of Honorary Treasurer.

DR. COPE moved a vote of thanks to Dr. Crago for his interesting address and to Dr. Dick for his assistance at the meeting in the discussion on medico-political subjects. The motion was carried with acclamation.

Scientific Papers.

DR. A. L. DAWSON read a paper on eczema. He emphasized that it was becoming more and more recognized that the forms of dermatitis to which the name eczema was given, were rarely if ever idiopathic. The removal of the cause of irritation was followed by cure, although it was often extremely difficult to discover the true cause. The use of other than very weak applications was a frequent cause of failure in treatment.

DR. H. G. LEAHY read a paper on some of the more important complications of gonorrhœa in the male. He made a plea for the use of the straight metal sound as opposed to the curved one in the treatment of urethral stricture. The essential factor in the treatment of gonorrhœal arthritis was massage of the prostate and seminal vesicles, if possible, twice a week for two months. This procedure had the effect of flooding the patient's system from time to time with an autogenous vaccine.

Several members asked questions and expressed their interest in the subjects of the papers.

A vote of thanks was accorded to both speakers for their instructive and interesting papers. Votes of thanks were also passed to the Queanbeyan and Canberra members for their hospitality.

Before the commencement of the meeting the members were served with afternoon tea. At 6.30 in the afternoon the meeting adjourned for dinner at which the members from Queanbeyan and Canberra acted as hosts.

THE ALFRED HOSPITAL CLINICAL SOCIETY.

A MEETING OF THE ALFRED HOSPITAL CLINICAL SOCIETY was held at the Alfred Hospital on June 30, 1925, MR. FAY MACLURE, O.B.E., the President, in the chair.

Bulbar Paralysis.

DR. J. R. BELL showed a female patient, aged sixty-two years, with weakness of the muscles of the right side of the face, wasting of the right trapezius, right-sided hemiatrophy of the tongue and right-sided palatal paresis. Eighteen months previously anæsthesia, difficulty in swallowing and regurgitation of fluids through the nose had appeared. These symptoms had gradually improved, but in the ensuing year she had lost 12.6 kilograms (two stone) in weight. On examination no abnormal neurological signs other than general hyperactivity of the tendon reflexes were present. The systolic blood pressure was 160 millimetres of mercury. The serum had not reacted to the Wassermann test. The *fundus oculi* proved normal. The physical signs were definitely less pronounced than when the patient had first come under observation three months previously, the only therapeutic remedy of any moment being iodide of potash.

Paget's Disease.

DR. F. M. READ showed a male patient, aged fifty-eight years, who had come to the Out-Patients Department complaining of pain, swelling and heat in the right leg from the knee to the ankle. He had stated that for two years he had suffered from a sensation of weight in this limb and from pain when he used the limb. He also noted that the right shin bone was becoming bowed. His general

health was satisfactory. On examination he was found to have a cellulitis of the soft tissues and curving of the tibia. The inflammatory condition had subsided with the application of hot moist dressings and the tremendous thickening of the tibia with its bowing could then be noted. There was no change observed in any other bone nor had his skull increased in size. X ray examination revealed great thickening of the compact bony tissue and a widening of the medullary canal. In the head of the bone disorganization of the cancellous tissue gave a smoky, fluffy appearance to the bone and this appearance extended to the marrow canal. The X ray appearance of the skull included some thickening of the diploe in the occipital region. From the X ray appearances a diagnosis of Paget's disease was made. Dr. Read said that in Paget's disease the thickening of the compact bone was due to a replacement of the true bony structure by a fibro-calcareous tissue whilst the "smoky" appearance in the marrow space was due to a true fibrosis of the marrow. With regard to the ætiology of the condition nothing definite was known. Struthers and Dawson, of Edinburgh, in a recent communication on the subject had suggested that it was of endocrine origin. In a case of *osteitis fibrosa cystica* in which *post mortem* examination was carried out, they had found an adenoma of the parathyreoid.

Mr. A. J. Trinca showed a specimen of osteitis deformans for the hospital museum.

Dr. G. E. Foreman remarked that the patient manifested a slight bowing of the shoulders, a symptom which seemed to him to add strength to the diagnosis.

Diathermy in Treatment.

Mr. Balcombe Quick, O.B.E., showed a female patient, aged sixty years, on whom nine months previously he had operated for carcinoma of the tongue. About half of the tongue had been removed by diathermy. The cervical glands on both sides were removed, the dissection being carried out by means of the diathermy knife. Healing had been rapid and so far there had been no sign of recurrence. Mr. Quick on being questioned stated that the knife was the most effective when the dissection was carried out along connective tissue planes, muscles being cut across the line of their fibres whilst under slight tension.

Mr. A. J. Trinca showed a man, aged fifty-three years, who for many years had had chronic ulceration of his lower lip. Recently under the tender care of a noted quack the ulcer had begun rapidly to progress and fungate. A clinically typical epithelioma had involved about three-quarters of the lower lip. To remove the same in the ordinary way would have necessitated an extensive operation.

Mr. Trinca on June 11, 1925, had removed the growth with the diathermy knife. Healing had been so rapid that on June 25, 1925, Mr. Trinca was able to bring together the edges and suture them, primary union following five days after the plastic operation.

Mr. Trinca's second patient was a woman, aged fifty-four years. She had had a small epithelioma of the lower lip for six months. This was treated by diathermy and less than a month later it had been almost impossible to find any sign of the trouble. Mr. Trinca said that he did not consider that removal of glands was a scientific procedure. If these were involved surgery was hopeless; if not, unnecessary.

Mr. J. R. Love showed two patients. The first, a male, aged sixty years, had come to the out-patient department in April, 1924, with a warty growth in the floor of the mouth, near the frenum. This had been excised and the base treated deeply with diathermy. The pathologist had reported the growth as a malignant papilloma. In February, 1925, the man had returned with a small ulcer on the right tongue margin. This had been treated in the same way as the first lesion. The pathologist had reported squamous celled carcinoma. At the meeting there could be found no evidence of any local disease and the scarring was very slight. The cervical glands appeared to be normal. Dr. Love remarked on the rarity of occurrence of two distinct types of carcinoma in the one month. The result so far was excellent.

The second of Dr. Love's patients was a male, aged fifty-eight, who had come complaining of a chronic ulcer of the face situated just to the left of the nose. This was evidently a rodent ulcer about 1.25 centimetres (one-half inch) in diameter. Dr. Love treated this with diathermy about one year previously. After some months the man had returned and it was seen that the ulcer had recurred in one small area. This had again been treated with diathermy and there was no sign of any recurrence. Mr. Love stated that he felt sure that more radical treatment in the first instance would have prevented the possibility of recurrence.

Dr. F. K. Norris gave details of a case of unresolved pneumonia in a child which he had treated with diathermy. The child had come to the Hospital in January, 1925, with pneumonia effecting the right lung. Skiagrams taken five, seven and eight weeks after onset of the illness were shown and one lung was seen to be abnormally opaque to the rays. Daily treatment by diathermy had been instituted and immediate improvement followed. Skiagrams taken one week after the institution of treatment by diathermy showed definite diminution of the shadow cast by the right lung. The child eventually left hospital apparently cured.

Mr. H. Trumble, M.C., showed two patients. A lantern slide of the first of these, prepared from a photograph taken prior to operation one month previously, depicted a man, aged fifty-nine years, with an extensive carcinoma involving most of the lower lip and spreading well on to the right cheek. This was a foul fungating ulcer which occasioned the man much discomfort besides being extremely painful. The whole area involved had been removed by the diathermy knife. From this time there had been no pain. Healing had been extremely rapid and one month later at the time of the meeting there was no sign of any carcinoma.

Mr. Trumble then showed a patient whom he had treated for thrombosed hæmorrhoids by diathermy. Following the operation there had been scarcely any pain and there was no evidence of infection. Mr. Trumble pointed out that this was characteristic of the immediate postoperative course when diathermy was employed. So far he had not encountered secondary hæmorrhage. Scarring was usually trivial.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A meeting of the Senate of the University of Sydney was held on November 2, 1925. The degree of Master of Surgery (Ch.M.) was conferred upon Miss Jessie E. Alexander, Mr. A. G. Bennett and Mr. P. N. Grieve.

Professor John Read and Professor J. T. Wilson have agreed to act as delegates of the University of Sydney at the Congress of the Universities of the British Empire which is to be held in London and Cambridge in July, 1926.

The following examiners were appointed:

Faculty of Veterinary Science.—Veterinary Anatomy: H. R. Carne, B.V.Sc.;
Veterinary Pathology and Bacteriology: H. R. Seddon, D.V.Sc.;
Veterinary Surgery and Obstetrics: V. E. H. Davis, B.V.Sc.;
Zootechny and Veterinary Medicine: M. Henry, B.V.Sc.

Faculty of Medicine—Pharmacology: Dr. John Macpherson;
Physiology: Professor W. A. Osborne;
Operative Surgery and Surgical Anatomy: Dr. J. L. McKelvey and Dr. A. A. Aspinall.

Mr. W. H. Love, B.Sc. was appointed Physicist to the Cancer Research Committee.

To the vacant Chair of Anatomy, the Senate has appointed Associate Professor A. N. Burkitt. Professor Burkitt graduated Bachelor of Medicine in the University of

Sydney with first class honours in 1916 during which year he also took the degree of Bachelor of Science. He entered the service of the University in 1919 as Lecturer and Demonstrator in Anatomy and on the recommendation of the late Professor Hunter he was promoted in July, 1924, to the grade of Associate Professor. At this time he was prosecuting his studies in histology and other branches of anatomy in Europe. Dr. Burkitt's appointment to the Chair was recommended by a Committee of Advice in England consisting of Professors J. T. Wilson and Elliot Smith, after it had been ascertained that Dr. Davidson Black was unable to accept the Chair.

Dr. Burkitt has a wide acquaintance with all branches of anatomy and anthropology and possesses abounding enthusiasm as an anatomist. He has proved himself to be a keen student of research and a man of considerable scientific gifts of knowledge and insight. His appointment to this important Chair should prove a happy link to the new Department of Anthropology shortly to be established by the University.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE undermentioned have been registered, under the provisions of *The Medical Act* 1915, as duly qualified medical practitioners:

Baker, Bernard Allen, M.B., B.S., 1925 (Univ. Melbourne), 5, Waterloo Street, Camberwell.

Baker, Frederick Harry Uther, M.B., B.S., 1925 (Univ. Melbourne. 167, Hoddle Street, Richmond.

Best, John Cleveland, M.B., B.S., 1925 (Univ Melbourne), "Pasadena," St. Kilda Road, Melbourne.

Boyd, Alva Janet, M.B., B.S., 1925 (Univ. Melbourne), 335, St. Kilda Street, Brighton.

Caulfield, Henry George, M.B., B.S., 1925 (Univ. Melbourne), 55, Crisp Street, Hampton.

Conlon, Victor Alexander, M.B., B.S., 1925 (Univ. Melbourne), 354, Punt Road, South Yarra.

Daley, Edward Alfred, M.B., B.S., 1925 (Univ. Melbourne 5, Clarinda Street, Caulfield.

Donaldson, William Edward, M.B., B.S., 1925 (Univ. Melbourne), "Illawarra," St. George's Road, Toorak.

Engelbrecht, Mavis Stella, M.B., B.S., 1925 (Univ. Melbourne), 33, Canterbury Road, Albert Park.

Gibb, Herbert Ian, M.B., B.S., 1925 (Univ. Melbourne), 25, Sunnyside Avenue, Camberwell.

Godbehear, Blanch May Annie, M.B., B.S., 1925 (Univ. Melbourne), Service Street, Bairnsdale.

Harbison, Noel Sinclair M.B., B.S., 1925 (Univ. Melbourne), 16, Alston Road, East St. Kilda.

Hartnett, Francis Timothy, M.B., B.S., 1925 (Univ. Melbourne), "Raheen," Westbourne Grove Northcote.

Hasker, John Reid, M.B., B.S., 1925 (Univ. Melbourne), Bank of New South Wales, Warrnambool.

Haywood, Arthur Robert, M.B., B.S., 1925 (Univ. Melbourne), 618, St. Kilda Road, Melbourne.

Herrington, Alexander Clement, M.B., B.S., 1925 (Univ. Melbourne), 45, Lincoln Road Essendon.

Higgins, Joseph Vincent. M.B., B.S., 1925 (Univ. Melbourne), 581, King Street, West Melbourne.

Hill, Keith Joseph, M.B., B.S., 1925 (Univ. Melbourne), 76, Park Street, Moonee Ponds.

Horton, Laurance Seymour, M.B., B.S., 1925 (Univ. Melbourne), 18, Kerferd Road, Albert Park.

Jago, George Cornwall, M.B., B.S., 1925 (Univ. Mel. bourne), 359, Glen Eira Road, Caulfield.

Jorgensen, Elef, M.B., B.S., 1925 (Univ. Melbourne), Jasper Road, Brighton.

Levy, Laura, M.B., B.S., 1925 (Univ. Melbourne), 96, Grey Street, St. Kilda.

Ley, Conrad Michael, M.B., B.S., 1925 (Univ. Melbourne), Warragul.

Lillie, Jeoffrey James, M.B., B.S., 1925 (Univ. Melbourne), 36, Central Park Road, East Malvern.

Maggs, George McIntyre, M.B., B.S., 1925 (Univ. Melbourne), 97 Marshall Street, Ivanhoe.

Mainland, Stuart Lindsay, M.B., B.S., 1925 (Univ. Melbourne), 241, Koroit Street, Warrnambool.

Mankey, Vivian Joseph, M.B., B.S., 1925 (Univ. Melbourne), "Cargerie," 356, Kooyong Road, Caulfield.

Murphy, George Edward, M.B., B.S., 1925 (Univ. Melbourne), 121, High Street, Kew.

MacGillivray, Ian Hamilton, M.B., B.S., 1925 (Univ. Melbourne), Blende Street, Broken Hill, New South Wales.

MacMillan, Wilfred Ewart M.B., B.S., 1925 (Univ. Melbourne), Ormond College, Parkville.

MacLean, Ian Gideon, M.B., B.S., 1925 (Univ. Melbourne), 109, Claremont Avenue, Malvern.

Parkinson, Arthur M.B., B.S., 1925 (Univ. Melbourne), 154, Park Street, West Brunswick.

Parry, Trevor Alexander, M.B., B.S., 1925 (Univ. Melbourne), 4, Goldsmith, Street, St. Kilda.

Renou, Cecil Ashley Marshal, M.B., B.S., 1925 (Univ. Melbourne), 74, Balaclava Road, Caulfield.

Richardson, Charles Edward, M.B., B.S., 1825 (Univ. Melbourne), 12, Jeffrey Street, North Preston.

Robinson, Gwendolen Winifred May, M.B., B.S., 1925 (Univ. Melbourne), "Carinya," Robinson Road, Preston.

Ryan, Eugene John, M.B., B.S., 1925 (Univ. Melbourne), 19, Lyndhurst Crescent, Auburn.

Serjeant, Brian Andrew, M.B., B.S., 1925 (Univ. Melbourne), 10, Malvern Road, Malvern.

Sicree, Reginald, M.B., B.S., 1925 (Univ. Melbourne), 537, Brunswick Street, North Fitzroy.

Skewes, Mary Alfreda, M.B., B.S., 1925 (Univ. Melbourne), 319 Sturt Street, Ballarat.

Speeding, Keith Rennick, M.B., B.S., 1925 (Univ. Melbourne), "Woorara," Ringwood.

Stephens, Frank Gladstone, M.B., B.S., 1925 (Univ. Melbourne), "Kooyong," Kooyong Road, Malvern.

Stevenson, Frances Mary Elizabeth, M.B., B.S., 1925 (Univ. Melbourne), "The Knoll," Bloomfield Road, Ascot Vale.

Stoney, Gerald John McComas, M.B., B.S., 1925 (Univ. Melbourne), "Glamorgan," Douglas Street, Toorak.

Stonham, Enid Stephaine, M.B., B.S., 1925 (Univ. Melbourne), 36, Mayston Street, Upper Hawthorn.

Symes, Stella Bradlaugh, M.B., B.S., 1925 (Univ. Melbourne), 63, High Street, Westgarth.

Taylar, Ernest Dove, M.B., B.S., 1925 (Univ. Melbourne), "The Anchorage," Marong.

Tewsley, Phyllis Margery, M.B., B.S., 1925 (Univ. Melbourne), 13, Manningtree Road, Hawthorn.

Additional Diploma Registered.

Russell, Exon Butchart, F.R.C.S., 1925 (Edin).

QUEENSLAND.

THE undermentioned have been registered, under the provisions of *The Medical Act* of 1867, as duly qualified medical practitioners:

Raymond, Arthur Wilmot, M.B., 1915 (Univ. Sydney), Winton.

George, William Ellis, M.B. Ch.M., 1922 (Univ. Sydney), Townsville.

Gutteridge, Noel Middleton, M.B., B.S., 1923 (Univ. Melbourne), Rockhampton.

Correspondence.

SUBACUTE COMBINED SCLEROSIS.

SIR: In your article on subacute combined sclerosis you quote me as having recorded a case in which achlorhydria was discovered a year before the anæmia.

Will you allow me to place on record two other cases, one in which I found achylia ten years before the develop-

ment of a typical pernicious anæmia, and another in which I found achylia twelve years before the onset of a similar anæmia? In the latter case I warned the patient of his danger and advised him to take hydrochloric acid continually. This he did with admitted benefit for some years, till a layman advised him to stop it because it would "eat away the coating of his stomach."

Within the last two weeks J. R. Bell and I have been investigating another case of complete *achylia gastrica* with a slight anæmia—red count 4,510,000; hæmoglobin 80% and a few rather large red cells associated with some anisocytosis. This man has curious feelings of weakness in his legs and some "pins and needles," but no demonstrable sensory changes or alteration of reflexes. We think it probable that he is an early subacute combined sclerosis and are now investigating his duodenal contents.

The importance of all this is the possible significance of the finding of an absent hydrochloric acid in the fractional test meal. Unless this can be accounted for by some other pathology, such as cholelithiasis or chronic gastritis *et cetera*, it should always raise a suspicion of a possible pernicious anæmia.

Further, in view of the end result in the two cases quoted an achylia should always lead to a thorough eradication of all discoverable septic foci at the earliest possible moment, to try and prevent these possible serious after effects.

Yours, etc.,

JOHN F. WILKINSON.

55, Collins Street, Melbourne.
(Undated).

RADIUM AND EPITHELIOMA OF THE LIP.

SIR: The relative merits of radium therapy and surgical excision in the treatment of epithelioma of the lip can be properly judged only when the best technique of each method is employed.

The surgical technique has long been standardized, does not appear susceptible of further improvement and its results are well enough known to all. On the other hand, in such advanced centres as Paris and New York radium technique has been vastly improved in recent years and is now regarded as superior to excision. I have closely investigated the respective merits of the two methods in their most efficient forms and am sure that the superiority of radium therapy will be generally recognized when the new technique becomes more widely known and used. The fears expressed by Dr. Archie Aspinall in the journal of October 31, 1925, have already been proved groundless under such conditions. A proper procedure of radium therapy, of course, includes effective irradiation of the associated lymph glands.

Yours etc.,

A. H. THWAITES.

12, Collins Street, Melbourne,
November 2, 1925.

Congress Notes.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

THE Honorary Secretary of the second session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927, Professor W. P. Gowland, announces that the following arrangements have been made by the Executive Committee.

Combined Meetings of Sections.

It has so far been decided to hold three combined meetings of several sections. The following is the provisional programme of these combined meetings.

Thursday, February 3, 1927.

9.45 a.m. to 12.30 p.m.—Goitre: Sections of Pathology and Bacteriology, of Preventive Medicine, of Medicine, of Surgery and of Radiology.

Monday, February 7, 1927.

9.45 a.m. to noon.—The Prevention of Diseases in Infancy and Childhood: Sections of Obstetrics and Gynæcology, of Diseases of Children and of Preventive Medicine.

Tuesday, February 8, 1927.

9.45 a.m. to 11.30 a.m.—Spastic Paralysis: Sections of Medicine, of Neurology, of Surgery and of Orthopædics.

11.30 a.m. to 12.30 p.m.—Cancer: All sections.

It is hoped shortly to publish some details concerning the proceedings of the individual sections.

THE JOHN IRVINE HUNTER MEMORIAL FUND.

THE Honorary Secretaries of the John Irvine Hunter Memorial Fund have forwarded to us a further list of contributions. In the list published last week the entry "Miss E. Booth Clarkson £5 5s." should have been "Mrs. J. Booth Clarkson £5 6s."

Amount previously acknowledged	£1,583	3	6
Professor Sir T. W. Edgeworth David, K.B.E., C.M.G., F.R.S., B.A.	10	0	0
Dr. W. B. Dight	5	5	0
Dr. V. McDowall	5	0	0
Dr. J. Paling	3	3	0
Dr. J. B. Allison	2	2	0
Dr. E. Pockley	2	2	0
Dr. J. M. Andrew	2	2	0
Dr. W. K. McIntyre	1	2	0
Dr. L. R. Featherstone	1	1	0
Dr. A. J. Bracken	1	1	0
Dr. E. M. Ferguson	1	1	0
Miss D. Read	1	0	0
Miss E. E. Harivel	0	5	0
Total	£1,618	7	6

A NEW JOURNAL.

THE Fellowship of Medicine has decided to produce an official organ, *The Post-Graduate Medical Journal*. The first issue is dated October, 1925. It will appear each month. The size of the page is demy quarto, that is the same as that of this journal. The first issue contains sixteen pages of reading matter and an eight-page supplement giving the programme for the year 1925-1926 of the post-graduate lectures, demonstrations and practical work of the Fellowship of Medicine. The new journal is introduced by Sir William Hale-White and Sir Berkeley Moynihan. The former would build a special post-graduate medical school in London and similar schools in other large towns. Unfortunately the cost of such a scheme appears to be prohibitive. The next best plan is to utilize the existing medical schools and teaching hospitals, notwithstanding the difficulty born of the differences between undergraduate and graduate teaching. The new journal is to be a medium for the information of the profession in regard to the progress of post-graduate instruction in Great Britain.

Sir Berkeley Moynihan seeks to induce medical practitioners to read for a short period every day, to attend meetings of a medical society and to join a post-graduate course. He asserts that learning both in acquisition and display is made more attractive by sharing it with others. Discussion and controversy are of the very spirit of scholarship and comradeship with those who labour in our own profession, makes of us colleagues rather than competitors.

The editorial notes are informative and give to the reader a general conception of the development of post-graduate work in Great Britain. It will be interesting to follow the gradual unfolding of the policy by those responsible for the journal and to watch for the translation of these principles into practice. The remainder of the issue is taken up by two admirable lectures, one by Sir Humphry

Rolleston, Bart., President of the Royal College of Physicians, on the medical aspects of gall stones, the other by Dr. T. W. Eden on the prevention of puerperal sepsis. Both are worthy of careful perusal and intelligent consideration. The subscription to the new publication is six shillings a year. Subscriptions should be forwarded to the Manager, *The Post-Graduate Medical Journal*, 1, Bedford Street, London, W.C.2.

RADIUM FOR HIRE.

MEDICAL practitioners in Sydney have had the advantage for a considerable time of being able to hire radium in suitable needles for the treatment of individual patients. The Radium Bureau have procured fifty milligrammes of radium enclosed in five platinum-iridium applicators for the use of medical practitioners in Melbourne. Practitioners wishing to hire needles of radium should apply to Mr. F. L. Baker, 117, Collins Street, Melbourne, who will supply all information and will give assistance to the best of his ability. Full use should be made of this arrangement, as it is obviously undesirable that the burden of holding such an expensive therapeutic agent as radium should be borne by a few individual practitioners.

Obituary.

EDMUND HENRY BURKITT.

WE regret to announce the death of Dr. Edmund Henry Burkitt, which occurred at Coogee, New South Wales, on November 13, 1925.

MORGAN PHILIP O'LEARY.

WE regret to announce the death of Dr. Morgan Philip O'Leary which occurred at Port Victor, South Australia, on November 6, 1925.

Books Received.

ON WRITING THESES FOR M.B. AND M.D. DEGREES, by Sir Humphry Rolleston, Bart., K.C.B.; Second Edition Revised; 1925. London: John Bale, Sons & Danielsson, Limited. Royal 16mo broad; pp. 28. Price: 1s. net.

PITFALLS OF SURGERY, by Harold Burrows, C.B.E., M.B., B.S. (London), F.R.C.S.; Second Edition; 1925. London: Baillière, Tindall and Cox. Demy 8vo., pp. 535. Price: 12s. 6d. net.

Medical Appointments.

Dr. Stanley George Whitfield (B.M.A.) has been appointed Government Medical Officer at Delegate, New South Wales.

* * * *

Dr. H. E. Clarke (B.M.A.) has been appointed District Medical Officer and Public Vaccinator at Leonora, Western Australia.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii..

DEPARTMENT OF PUBLIC INSTRUCTION, BRISBANE: Medical Officer.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY: Resident Medical Officer.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY: Honorary Assistant Radiographer.

WESTERN AUSTRALIAN PUBLIC SERVICE: Psychologist.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary B.M.A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Renmark and Murat Bay. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

DEC. 1.—Victorian Branch, B.M.A.: Branch; Ballot paper returned and counted.
DEC. 1.—Tasmanian Branch, B.M.A.: Council.
DEC. 1.—New South Wales Branch, B.M.A.: Ethics Committee.
DEC. 2.—Victorian Branch, B.M.A.: Annual General Meeting.
DEC. 2.—Section of Obstetrics and Gynæcology, New South Wales.
DEC. 3.—Section of Orthopædics, New South Wales.
DEC. 8.—Tasmanian Branch, B.M.A.: Branch.
DEC. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
DEC. 9.—South Sydney Medical Association, New South Wales.
DEC. 10.—New South Wales Branch, B.M.A.: Branch (Ordinary).
DEC. 10.—Victorian Branch, B.M.A.: Council; Election of office-bearers, 1926, and appointment of Committees.
DEC. 10.—South Australian Branch, B.M.A.: Council.
DEC. 11.—Queensland Branch, B.M.A.: Branch (Annual).
DEC. 11.—Western Australian Branch, B.M.A.: Council.
DEC. 14.—New South Wales Branch, B.M.A.: Organization and Science Committee.
DEC. 15.—Tasmanian Branch, B.M.A.: Council.
DEC. 15.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.